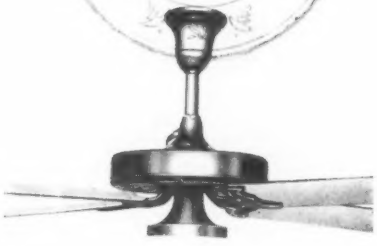
SEPTEMBER, 1940

ELECTRICAL SOUTH

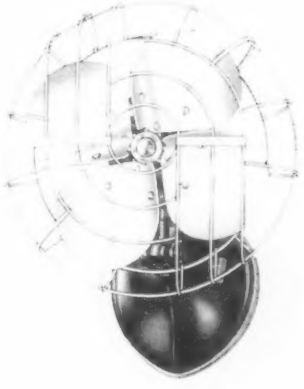
UNIVERSITY OF FLORIDA
Library



HUNTER engineers, through traveling contacts and actual experience, continue to find new locations for the use of ZEPHAIR Cooling Units and the many other famous models of HUNTER Fans.

Hotels, apartment houses, stores, homes and clubs may now have the benefit of HUNTER engineering research and recommendations without cost or obligation.

Please write for special information covering winter prices and surveys now ready for next season.



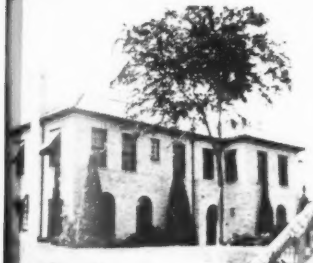
HUNTER FAN & VENTILATING CO., INC.

Factory: FULTON, N. Y.

General Sales Offices: Memphis, Sterick Bldg.
Eastern Sales Office: New York, 92 Warren Street

Sales Offices:

ATLANTA	DALLAS	KANSAS CITY
BOSTON	DAVENPORT	LOS ANGELES
CHICAGO	DETROIT	NEW ORLEANS
CLEVELAND	HOUSTON	PHILADELPHIA
		PITTSBURGH
		ST. LOUIS

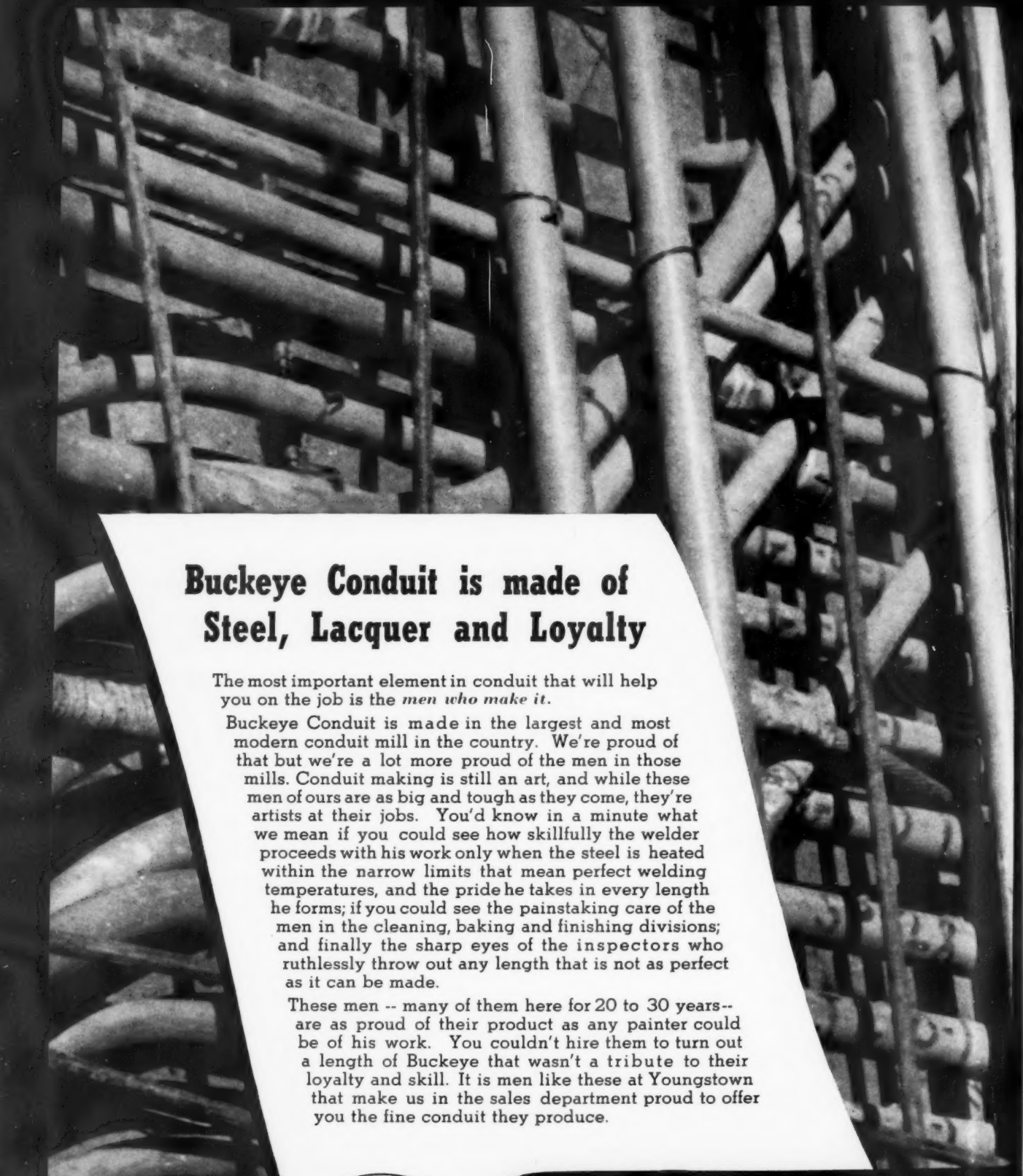


RESIDENCE
ADOLF MAYER
DALLAS TEX.

BATTLE HOUSE
MOBILE ALA.

LYLE - CRENSHAW INC.
APPLIANCE AND HUNTER DEALERS
MEMPHIS TENN.

HUNTER Century



Buckeye Conduit is made of Steel, Lacquer and Loyalty

The most important element in conduit that will help you on the job is the *men who make it.*

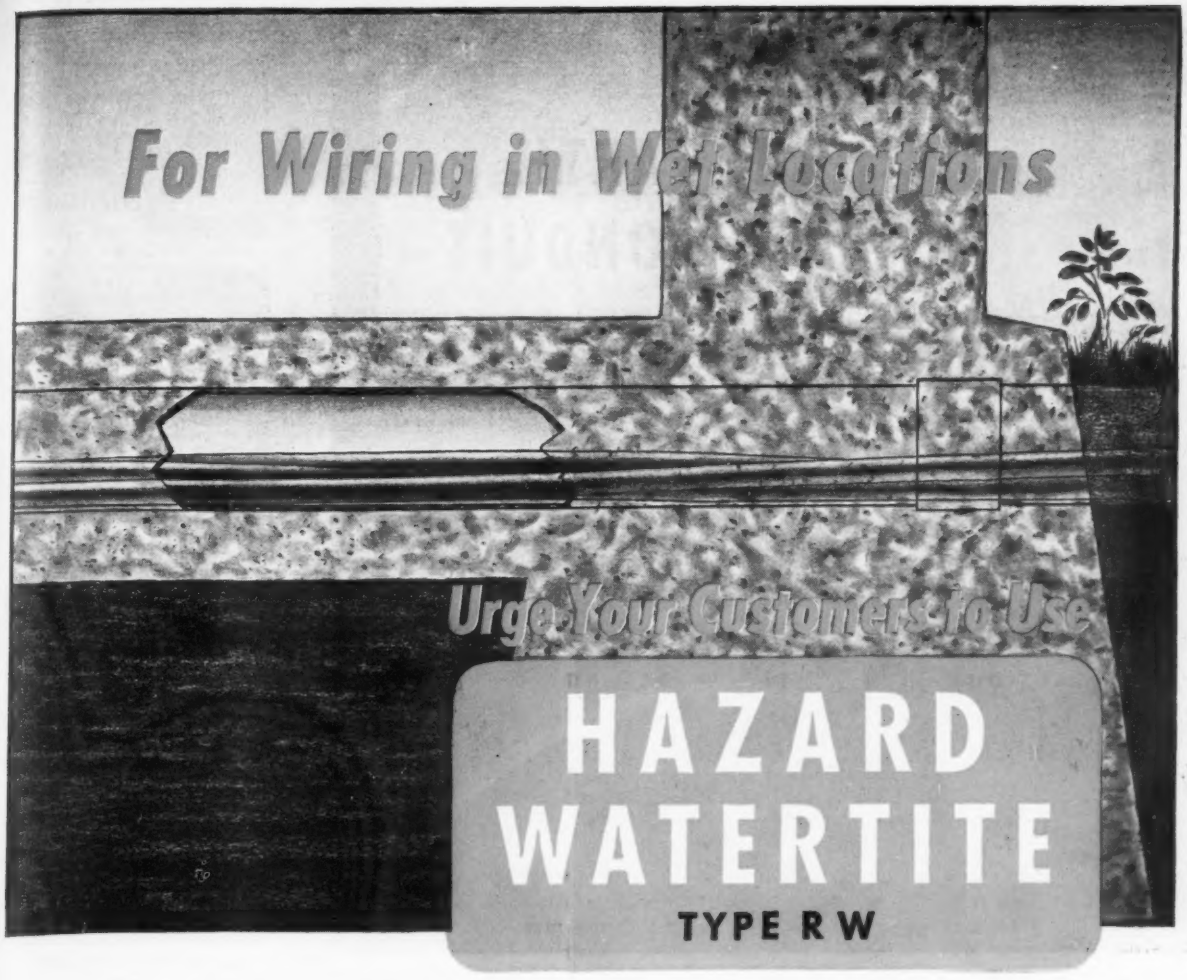
Buckeye Conduit is made in the largest and most modern conduit mill in the country. We're proud of that but we're a lot more proud of the men in those mills. Conduit making is still an art, and while these men of ours are as big and tough as they come, they're artists at their jobs. You'd know in a minute what we mean if you could see how skillfully the welder proceeds with his work only when the steel is heated within the narrow limits that mean perfect welding temperatures, and the pride he takes in every length he forms; if you could see the painstaking care of the men in the cleaning, baking and finishing divisions; and finally the sharp eyes of the inspectors who ruthlessly throw out any length that is not as perfect as it can be made.

These men -- many of them here for 20 to 30 years -- are as proud of their product as any painter could be of his work. You couldn't hire them to turn out a length of Buckeye that wasn't a tribute to their loyalty and skill. It is men like these at Youngstown that make us in the sales department proud to offer you the fine conduit they produce.

BUCKEYE TRADE MARK YOUNGSTOWN CONDUIT

26-14 C

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices - YOUNGSTOWN, OHIO



Hazard Watertite rubber insulation is extremely moisture resisting and retains its electrical characteristics to a very high degree even after prolonged immersion: (tests on samples kept under water for 5 years actually show no loss of insulation qualities whatsoever).

Developed originally to meet the severe conditions encountered in coal mines, Hazard Watertite is exceptionally strong and tough having a tensile strength of about 2500 lbs. per sq. inch.

Hazard Watertite conforms to the requirements of Type RW Wires in the 1940 National Electrical Code for wiring in wet locations (Section 3035). Its use permits lighter and less costly cable assemblies and simplifies installation.

Write for full particulars.

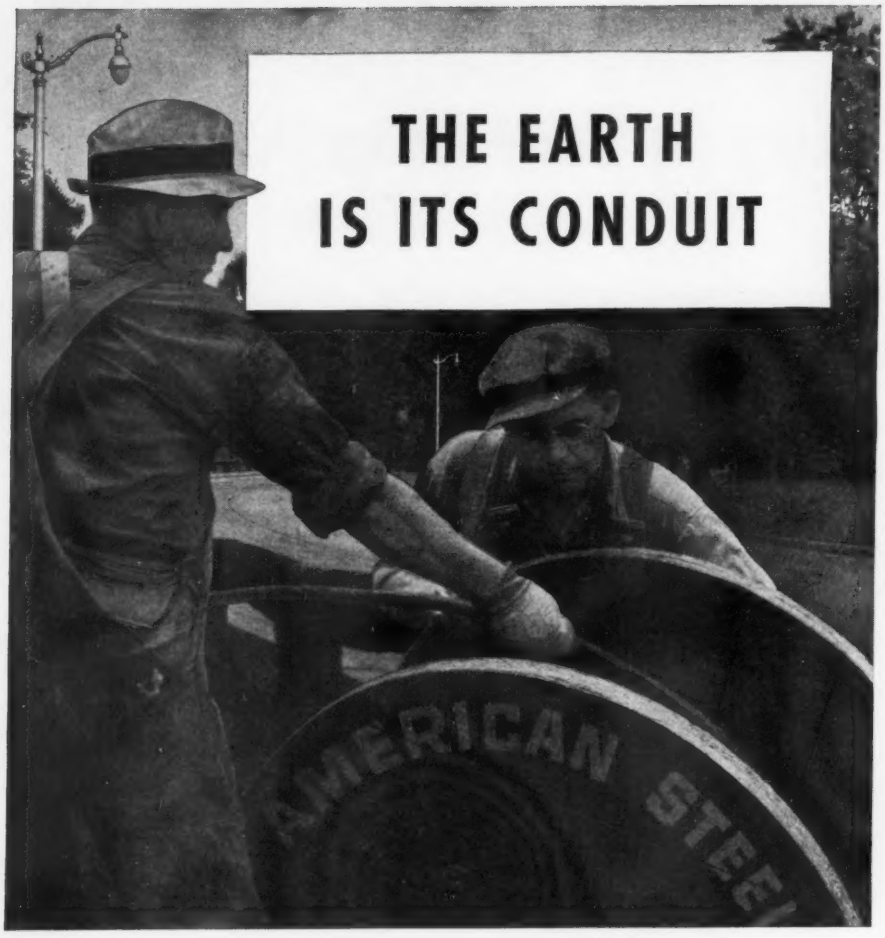
HAZARD INSULATED WIRE WORKS

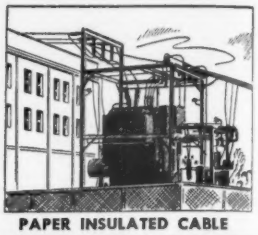
DIVISION OF THE OKONITE CO.

WORKS: WILKES-BARRE, PENNSYLVANIA

New York Chicago Philadelphia Atlanta Dallas Washington Cleveland Pittsburgh Buffalo Boston Detroit Seattle San Francisco St. Louis Los Angeles

ELECTRICAL SOUTH is published monthly by W. R. C. Smith Publishing Co., Marietta, Ga., and Atlanta, Ga., U. S. A.
Subscription rates United States and Possessions $1.00 for one year; $2.00 for three years; Canada $1.50 per year; Foreign Countries $2.00 per year
Entered as second class matter at postoffice, Marietta, Ga., under Act of March 3, 1879.
Volume 20 Number 9

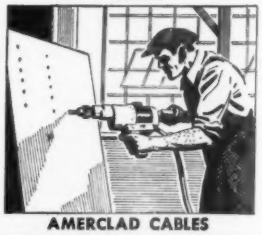


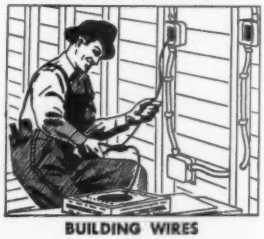

PAPER INSULATED CABLE

AMERBESTOS CABLES

VARNISHED CAMBRIC CABLES

RELIANCE WEATHERPROOF WIRES


AMERCLAD CABLES


BUILDING WIRES

AMERSEAL PARKWAY CABLE

gives lasting service buried directly in earth

NO ducts. No conduit. No external protection of any kind. That's the reason why contractors and engineers prefer to use Amerseal non-metallic Parkway Cables. They can be laid directly in an ordinary plowed furrow or hand-cut trench. They save time . . . save materials . . . save money.

The conductors are tightly sealed in a moisture-proof jacket of tough, lively rubber, and further protected by a covering of asphalted jute. Neither moisture nor earth acids and alkalis can penetrate. In hundreds of installations, Amerseal has proved its ability to give years of trouble-free service at rock-bottom cost.

Amerseal is versatile. You can bury it directly in the ground, run it up a pole, attach it to a structure, or string it on a messenger. In every application you'll find it effective.

For circuits which require more positive protection against physical damage, use our metallic types of Parkway Cable, sheathed in lead and armored with steel or bronze. Send today for our complete catalog of Parkway Cables.

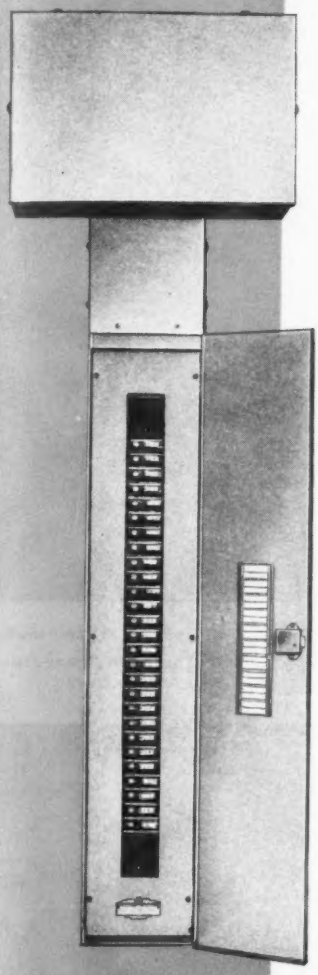
AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* — United States Steel Export Company, New York

UNITED STATES STEEL

WHAT IS *Your* Part in the Defense Program?



If the plant is to run smoothly and without interruption, power and light distribution must be as perfect as it is humanly possible to make it. *The electrical system is vital to continuous operation.* Check it in detail—so that emergency may not find it with fatal weaknesses.

Efficient and dependable busducts—switchboards—panelboards—safety switches—and other electrical equipment for power and light distribution should be installed. These should be of ample capacity and of *thoroughly reliable make!*

Nearly fifty years of conscientious development and production place (FA) Products in a strong position to meet these important requirements. They combine moderate first cost with low up-keep—and they are *made better than necessary.* . . . In new and modernized plants, these (FA) Products will serve faithfully and well:

Power and Light Distribution Panelboards (Standard and Column Types) . . . Klampswitchfuz Narrow Distribution Panelboards (for floor and wall mounting) . . . Feeder Busducts . . . Plugin Busducts . . . Shutlbrak Safety Switches . . . and many others.

Will the (FA) Column Type Panelboard fill your requirements better than the Standard Type?

The (FA) Industrial Column Type Panelboard, with suitable cabinet, is designed to be mounted between the flanges of 8″, 9″ or 10″ H Columns. It may also be used to advantage in any other location where the available space will not accommodate a standard width Panelboard.

These Panelboards are furnished for either single-phase, 3-wire, 115/230 volt solid neutral service, or for 3-phase, 4-wire, 120/208 volt solid neutral service—and are obtainable with 4 to 40 single-pole branch circuits.

Let Our Sales-Engineers Help You

Their long experience is at your service—without obligation, of course . . . And write for *New* Catalog No. 56 and Bulletin No. 60 . . . Frank Adam Electric Company, St. Louis, Mo.

EST. 1891 THE SIGN OF A BETTER JOB

FA

Frank Adam

ELECTRICAL PRODUCTS

for Industry

FRANK ADAM ELECTRIC CO.
ST. LOUIS, MO. U.S.A.

Some call it the "SLAUGHTERHOUSE"

By any name, it is the place where lead sheath is deliberately destroyed so that weaknesses can be noted and corrected..so that your ANACONDA CABLE will have

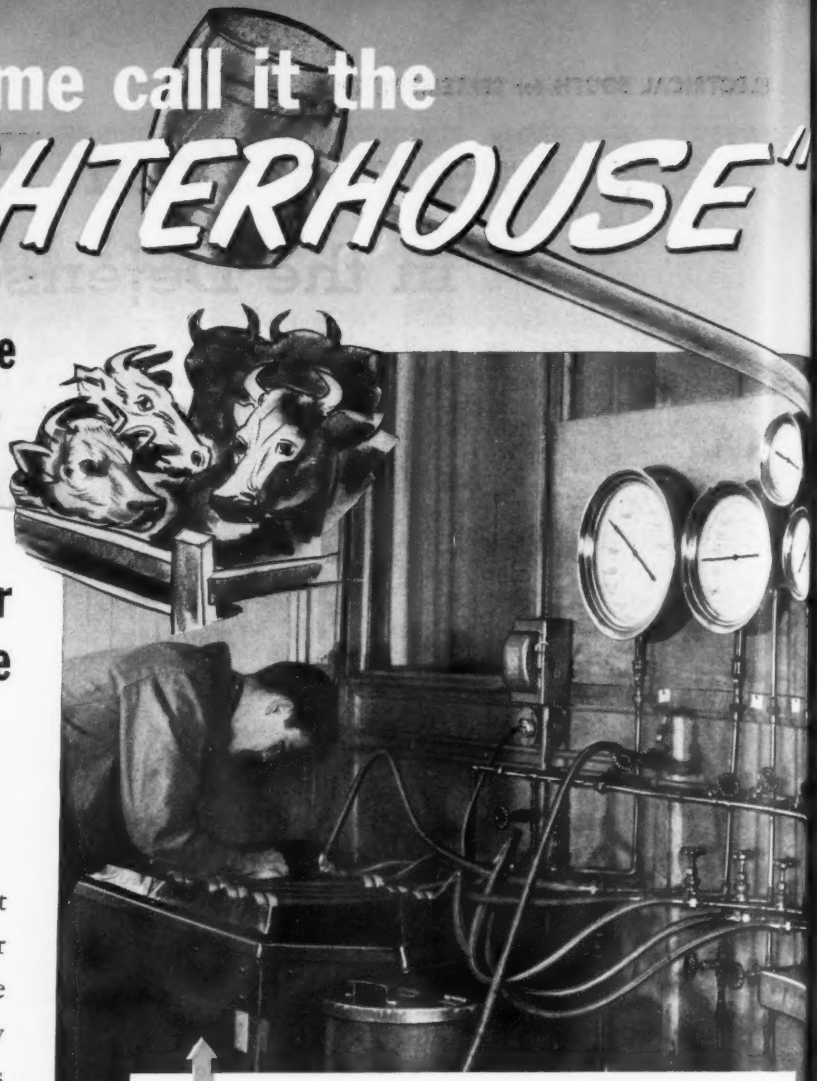
Longer Life

PERHAPS an even better name might be "The Life Extension Institute" for here Anaconda Wire and Cable achieve longer life and durability. Here, purposely subjected to irresistible pressures, metals fail. From studying these failures, Anaconda research men learn to make wire and cable that last longer.

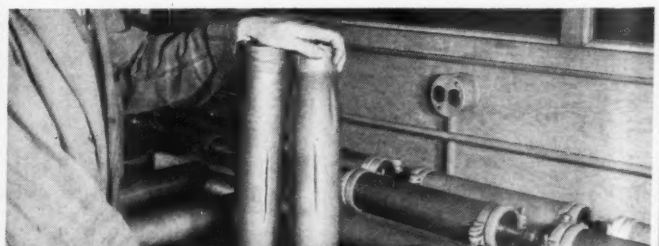
Research, painstaking and precise, is the basis of Anaconda's manufacturing control...a control that makes it possible for Anaconda to produce constantly better and more serviceable products to meet the needs and demands of American industry.

ANACONDA
from mine to consumer

40867



This technician is putting lead sheath lengths on their death bed. They will be subjected to pressures that will ultimately break down their structure to a point of failure.



Destroyed. These are samples of lead sheath after the test. What caused them to fail and how the deficiency, if any, can be corrected is the next step in building longer life into Anaconda cables.

USE MODERN IMPROVED **Anaconda Wire & Cable**

ANACONDA WIRE & CABLE COMPANY, General Offices: 25 Broadway, New York City; Chicago Office: 20 North Wacker Drive
A Subsidiary of Anaconda Copper Mining Company. Sales Offices in Principal Cities

SEPTEMBER, 1940

Volume 20 No. 9

ELECTRICAL SOUTH

J. C. MARTIN, Manager
RICHARD P. SMITH, Promotion Manager
W. E. COOGLER, Production Manager

Editorial and Business Offices
GRANT BUILDING
ATLANTA, GEORGIA

MEMBER OF A. B. P.
MEMBER OF A. B. C.

ANNUAL SUBSCRIPTION—$1.00
THREE YEARS—$2.00
CANADA—$1.50; FOREIGN—$2.00

Business Representatives:
L. E. ALLEN, 189 West Madison St., Chicago, Ill.
L. R. MCCARTY, 325 Winding Way, Merion, Pa.
W. S. CUSHION, 506 The Arcade, Cleveland, Ohio.
W. A. MCGEE, P. O. Box 562, Charlotte, N. C.

Published Monthly by
W. R. C. SMITH PUBLISHING CO.
Marietta and Atlanta, Ga.

W. R. C. SMITH, *Chairman of Board,*
W. J. ROOKE, *President,*
T. W. MCALLISTER, *Vice-President and Editorial Director,*
E. W. O'BRIEN, *Vice-President,*
W. S. CUSHION, *Vice-President,*
R. W. PHILIP, *Vice-President,*
O. A. SHARPLESS, *Treasurer,*
J. C. MARTIN, *Secretary,*
E. L. PHILPOT, *Asst. Secretary and Treasurer*

Publishers Also of
COTTON
SOUTHERN HARDWARE
SOUTHERN AUTOMOTIVE JOURNAL
SOUTHERN POWER AND INDUSTRY

T. W. McALLISTER, Editorial Director CARL W. EVANS, Editor
NAT M. JOHNSON, Southwestern Editor

Contents

Electrical Business Trends	7
Advertise Your Personality	8
National Washer and Ironer Week	10
The Football Conference Sales Contest	13
Three-Year School Lighting Experiment	14
Designing Protective Lighting for Industrial Plants	16
Inspectors Converge on Houston for Annual Meeting	19
N. E. C. A. Convention Plans Complete	20
Lower Overhead and Higher Sales	21
Understanding and Using the National Electrical Code	22
Distribution System Economics—Part I	30

Departments

Code Discussion	22
Motor Rewinding and Repair	24
News of the Industry	33
Manufacturers' News	41

Copyrighted 1940, W. R. C. Smith Publishing Co., Atlanta, Ga.

Entered as second class matter at Marietta, Ga., U. S. A., under Act of March 3, 1879.

Henry Bulbsnatcher's last stand!

Observe the final desperate plight of the chronic bulb-snatcher! He has robbed one socket to fill another until he is down to the last bulb in the house. If anything happens to that we can foresee only the breakup of a once happy home. The one hope is that with no more bulbs to snatch, Henry will begin life anew by treating himself to a flock of new G-E MAZDA lamps.

May we suggest that you do the same thing yourself before you become a slave to the sly habit of bulbsnatching? Check up now. Do the bulbs in each of your reading lamps total at least 100 watts, well-shaded? (Some need more.) Are they made by G-E? The right bulb can make all the difference between comfort and eye-strain! Get the right size—and insist on the G-E monogram!

THIS COPY GOT A TREMENDOUS READING in a full page G-E ad in the Saturday Evening Post. It typifies General Electric's exclusive "bulb-snatching" story which is being plugged constantly in magazines and radio. Surveys show this "theme" has got all America talking about the need for keeping more right-sized bulbs on hand. If you don't believe it, ask your own family!

G-E MAZDA LAMPS

GENERAL ELECTRIC

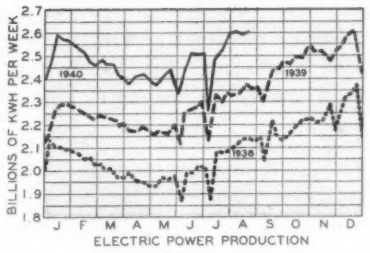
Electrical Business Trends

MOTORS, generators, transmission and distribution equipment achieved new highs for 1940 in June, the latest month for which industry statistics are available. Motors and generators were up 44% over May; transmission and distribution equipment, 43.7%.

Unit sales for electric refrigerators eased off from their May position but still reached a record high for the month of June. Major appliances other than refrigerators declined to a new low for the year, a decrease of 18.3% from May.

Substantial gains in all branches of the industry were recorded during the first six months of 1940 in comparison with the same months of 1939. The gain for motors and generators (orders received), was 45.3%; industrial materials (sales billed), 36.2%; transmission and distribution equipment (orders received), 34.7%; major appliances other than refrigerators (sales billed), 18.6%; and refrigerators (sales billed), 38.1%.

In the sixteen southern states appliance sales were especially good in comparison with 1939. For the first 6 months of 1940, 58,911 ranges were sold in the South, a gain of 43% over the same period of 1939. The increase for the country as a whole was 34%. Refrigerator sales in the southern states during the first half of 1940 amounted to 415,726, a gain of 34% over 1939. The national increase amounted to 32%. Washer sales continued to show improvement in the southern states. July 1940 sales totaled 20,500 units, as compared to 17,750 in June 1940.



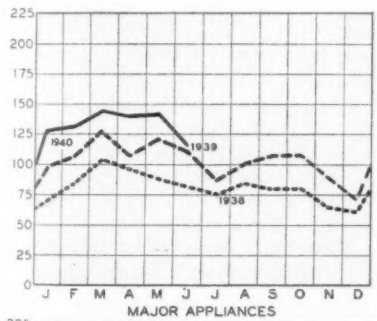
ELECTRIC POWER PRODUCTION

Per Cent Changes 1940 Over 1939	Week Ending Aug. 17	Week Ending Aug. 10
New England	+ 3.1	+ 3.7
Middle Atlantic	+ 5.6	+ 6.4
Central Industrial	+16.4	+15.9
West Central	+ 8.5	+11.1
Southern States	+ 8.1	+11.2
Rocky Mountain	+18.2	+19.4
Pacific Coast	+ 5.0	+ 5.3
Total	+10.1	+11.0

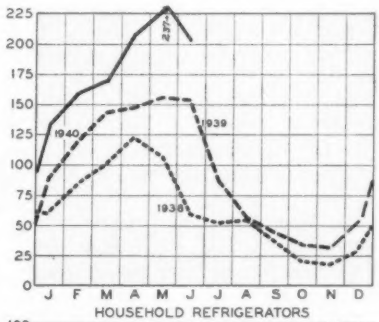
Building Permits Increased

Building permits in the South during the month of July were especially favorable in comparison with the country as a whole. In the new residential building classification, the East South Central states had permits 229.6% greater than in June 1940; South Atlantic states, 50.5% increase; and West South Central states, 24.3% increase; although the increase for the nation as a whole was 24.9%. In the total building classification, the increase for the nation during July in comparison with June was 19.9%; corresponding increases in the southern states were: South Atlantic, 45.0%; East South Central, 75.5%; and West South Central, 30.6%.

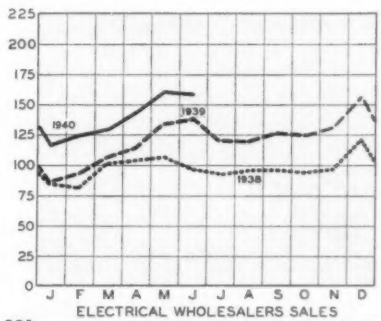
A fall modernization campaign sponsored by the Federal Housing Administration, which will promote wiring, new fixtures, more outlets, and modern safety devices, along with other major construction details, is expected to aid the electrical construction industry materially during the next few months.



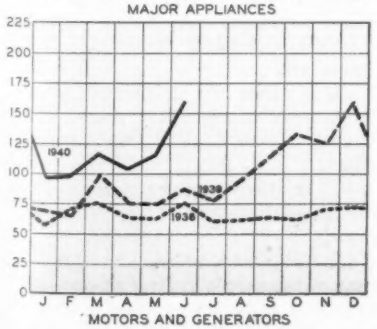
MAJOR APPLIANCES



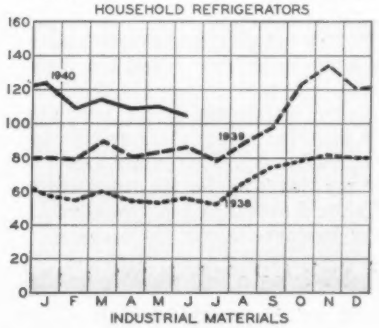
HOUSEHOLD REFRIGERATORS



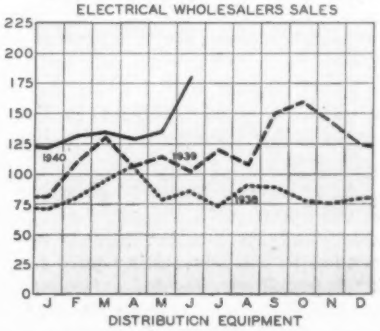
ELECTRICAL WHOLESALERS SALES



MOTORS AND GENERATORS



INDUSTRIAL MATERIALS



DISTRIBUTION EQUIPMENT

All of the above indexes of electrical business activity are based on figures available from the National Electrical Manufacturers Association, except the index of electrical wholesalers' sales which is based on data published by the United States Department of Commerce. The indexes on motors and generators and distribution equipment are based on orders received, while the index on industrial materials, including such items as electrical porcelain, mica, vulcanized fiber and laminated products, is based on sales billed. The index on distribution equipment includes such items as high voltage insulators, paper cable, power switching equipment, power distribution transformers, and varnished cambric cable. The index on major appliances does not include refrigeration. The index on household refrigerators includes complete household refrigerators, separate household evaporators, and separate systems of 1/4 horsepower or less. The index on electric power production is based on data released by Edison Electric Institute. 1936 averages taken as 100%.

Advertise Your Personality

Should the appliance dealer use manufacturers' advertising? Certainly, advises this promotion authority, but he should do some "personality advertising" too!

ASK almost any dealer in electrical merchandise whether he advertises, and his probable answer will be, "Oh, sure, if the manufacturer will pay enough of the cost."

Now, it is undoubtedly smart business to use all of the free advertising help a manufacturer or distributor of electrical appliances will provide but is it wise to conclude that that's all the advertising an electrical dealer need do if he expects to stay in business over a period of years?

The reason for the emphatic "NO!" in answer to this question may be suggested by honest answers to the following questions which the thoughtful dealer will want to ask himself.

Does the manufacturers' advertising help develop a personality for my store?

Do I expect people to buy electrical appliances from me solely because I am handling the Super-Super (or some other) brand; or do I expect them to buy because I am a good salesman or have good, honest, able salesmen working for me, or because they have confidence in me as a solid merchant in the community?

If there is another Super-Super dealer in town, will the manufacturer's advertising induce the prospect to come to my store instead of my competitor's?

Am I certain that I will always want to handle the Super-Super brand?

Can I be sure that I will always be acceptable as a dealer to the Super-Super people or their distributor?

After several years of plugging Super-Super, with the name of my store and its location merely appended to the advertising paid for by Super-Super, devoted entirely to praise of Super-Super or its products, where will I be should circumstances make it seem desirable to switch to Hi-Quality (or some other brand) appliances?

Wouldn't I be just where I started when I took on Super-Super?

By C. M. Kilian

Advertising Manager
Alabama Power Co.

Suppose I should want to broaden my business and take on lines other than electrical, to fill up some of the valleys in "slow" seasons, would Super-Super Mfg. Co. advertising help me?

From a careful consideration of the answers to these questions, it is difficult to escape these conclusions:

1. By all means use all of the free advertising any manufacturer offers.

2. Manufacturers' advertising emphasizes brand name and product—does not personalize or popularize my store.

3. As a kind of insurance against the day when I might conclude to change lines, or expand my business, I should do some advertising beyond merely appending my name to manufacturers' mats and should popularize my store in my name, or in my firm's name. In other words, I should establish a personality for my business.

Publicizing a Store's Personality

It might seem superfluous to state that before publicizing a store's personality, it must be determined that a personality suitable for publicization exists. That is not always the case. If a store has a negative personality, then by all means, the best thing to do would be to keep as quiet as a graveyard about it—the less advertising done, the better, so fewer customers would be enticed to come in and be displeased.

What makes up an advertisable personality of a store or business?

Here is a list, presented without any claim to completeness, which you might use as a check chart to determine whether your store has an advertisable personality:

1. Proprietor, clerks and salesmen cheerful, neat and clean.

2. No "city slicker" policies on trades.

3. No misrepresentation regarding merchandise or guarantees.

4. No extravagant claims for performance of product.

5. Unique location of store or uniqueness of store.

6. Modernity of store and its neatness and cleanliness.

7. Prompt performance of promises.

8. Appliance re-building department.

9. Appliance rental service (floor polishers, cleaners, spot lights).

10. Efficient, prompt and neat service department. (Does the service man leave trash laying around after a service call, or does he clean up? Does the service man look like a bum or does he appear to be a gentleman?)

11. Tie-in on community events.

12. Testimonials from satisfied customers.

13. If store is a neighborhood or small town store, offer use of the floor for small club meetings at night.

14. In the spring, permit the garden club to use it for a flower show.

15. Telephone voice, and that of your sales people reflect the cheerfulness you like to hear when someone calls you.

16. Prompt in the rectification of mistakes or replacing faulty merchandise.

17. Present customers think so well of you that they are willing

to say to their friends, "Buy it from Jones; he's a nice guy to deal with, and you can rely on what he sells you being worth what you pay."

18. Specialize on just one item, or have a varied line of electrical and other merchandise.

19. First to take on new devices ("You can always get the latest thing out at Jones'.")

20. Take on new devices only after they have been proven ("Jones sells only tried and tested products.")

21. Good at planning or redesigning kitchens.

Any one of the above twenty-one store personality items, if true about your store, can be the basis of an advertisement designed to tell persons who are not yet acquainted with your store something about its personality, and to impress on their consciousness over a period of time, that Jones' must be a pretty good place to deal. Then when they are in the market for a device you are selling, they will at least give you a chance at selling them.

Your advertising to personalize your store need not be lavish or spectacular. It should be *regular*. That is, you should do it week in and week out. Better a series of small advertisements appearing regularly, than big ones appearing intermittently.

Here are some of the simple ways in which you can advertise and keep within your advertising budget, which probably should not be over 3 to 5% of your gross sales on specialty items, and not over ½ to 1% of your gross on staples:

Newspaper space.

Radio.

Circulars by mail and house to house.

Letters.

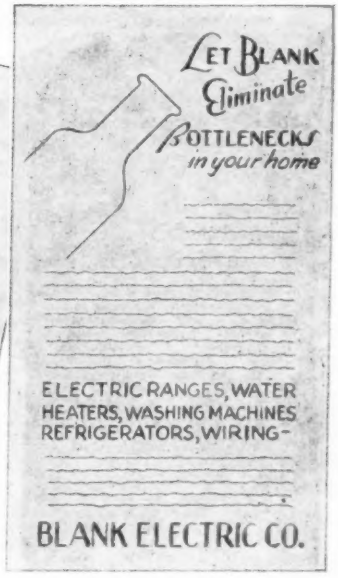
Telephone calls.

Neat display cards in your windows.

Occasional free souvenirs—flower seed in spring and bulbs in fall, for example.

(*Continued on page* 54)

AS LONG AS THEY LAST
A Rose Bush to Every Woman Who Visits Our ELECTRICAL RANGE DEMONSTRATION
VISIT OUR ELECTRIC RANGE DEMONSTRATION THIS WEEK AND GET YOUR FREE ROSE BUSH
BLANK ELECTRIC CO.


LET BLANK Eliminate BOTTLENECKS in your home
ELECTRIC RANGES, WATER HEATERS, WASHING MACHINES REFRIGERATORS, WIRING-
BLANK ELECTRIC CO.

AS LONG AS THEY LAST

A Free Rose Bush to Every Woman Who Visits Our Electric Range Demonstration This Week

What's an electrical store doing giving away rose bushes—a flower that requires a lot of care? We have two reasons—one is that we'd like to see our town become a city of flowers. A nice flower garden requires time and attention. And that's where we come in—when you let us install an electric range or water heater, you immediately give yourself more time to look after flowers, to play with the kids, or go to your garden club.

VISIT OUR RANGE DEMONSTRATION TH'S WEEK AND GET YOUR FREE ROSE BUSH.

TESTED AND PROVED

That is the kind of electrical equipment Blank's handles, and that's why we've been able to stay in business for —— years, because our customers come back each time they want an additional appliance and also recommend us to their friends. We are not a "price" store—although we always give you good value for your money—and have no "wildcat" merchandise to offer you. We stick to the tested and proved appliances—that gives you satisfaction, and saves us (and you) a lot of annoyance.

Frigidaire Refrigerators—General Electric Ranger—ABC Washers—Westinghouse Water Heaters—Universal and Sunbeam Appliances

P.S. Also wiring—from a single convenience outlet to an office building.

LET BLANK ELIMINATE THE "BOTTLENECK" IN YOUR HOME

You read today about "bottlenecks" in industry—how they slow things up. Well, it's the same way with "bottlenecks" in the home—caused by a lack of enough electrical convenience outlets in this room or that—usually in the kitchen or living room.

We're bottleneck eliminators—can install for you one or more convenience outlets so that you can use your electrical appliances more conveniently, without stringing extension cords all over the place. Ask us to come to your home and make an estimate—no obligation.

ELECTRIC RANGES AND WATER HEATERS AND WASHING MACHINES

They do more to eliminate home "bottlenecks" than anything else. And you'll be surprised at how little they cost to operate—how much more time they give you to do the things you like to do.

We handle Hotpoint Ranges and Water Heaters—Easy Washing Machines and dozens of other appliances; also I.E.S. Lamps.

Here are suggested layouts and copy for advertisements which do more than advertise a product—they establish the personality of the firm and impress on the consciousness of prospective purchasers that "your" store can best meet their household appliance and wiring needs.

NATIONAL WASHER

(1)

This national promotion provides a splendid opportunity for dealers everywhere to give washer and ironer sales a tremendous boost.

ONCE again washer and ironer dealers will feel the spotlight of public attention when thousands of dealers cooperate with the American Washer and Ironer Manufacturers' Association in sponsoring National Washer-Ironer Week. This year October 19 to 26 has been selected for a week of intensive promotion. A number of the manufacturers are preparing special campaigns for their dealers, much attractive and interest-compelling display and sales help material will be made available, and the general enthusiasm on the part of dealers carried over from the promotions of previous years indicates that local promotions will achieve a new high in display, publicity and sales effort.

Taking a tip from the success of National Washer-Ironer Week's window display contest in 1939, the American Washer and Ironer Manufacturers' Association again will award cash prizes in a similar competition October 19-26, according to announcement by Joseph R. Bohnen, Chicago, executive secretary.

"Identical prizes will be given in each of three divisions of stores, classified to hold competition on an equal basis," Secretary Bohnen said. "To obtain greatest possible enrollment, a special cash award will be given to every manufacturer or distributor salesman instrumental in first lining up any window that proves to be a prize-winner. Windows will be judged on the

(2)

(3)

(4)

AND IRONER WEEK

general basis of attractiveness and selling appeal. Use of the display card to be supplied dealers by the manufacturers will not be obligatory."

Store classification for the window display contest will include large department stores and utilities in one group, appliance shops and hardware stores in another, and furniture stores, small department store and others in another. Prizes in each classification will be $200 for first place, $100 for second, $50 for third, and four $25 prizes for four fourth prizes.

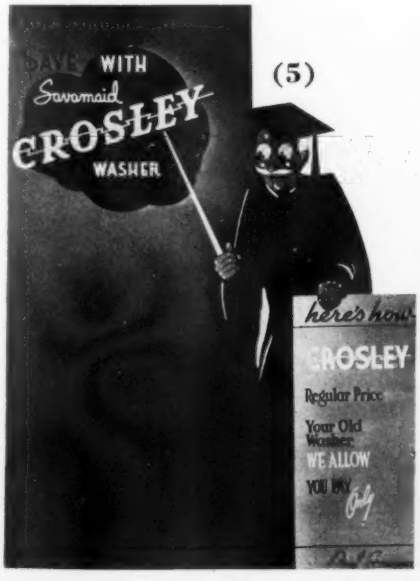
Although this annual promotion offers a splendid opportunity for the individual appliance dealer to present his line at a time when the public is being made "washer-ironer conscious" through innumerable displays, advertisements and radio spots, there are much greater possibilities where cooperative promotion is possible through a dealer association, through a local electrical league, or in cooperation with a local utility.

As an example of what may be accomplished through such cooperative action, consider the successful promotion conducted in one city last year. Interest in this annual promotion had gained considerable impetus from previous years—so much so that dealers in this small city of slightly more than 100,000 population were successful in bringing the facts about home laun-

Nearly every manufacturer will make available a wide range of sales helps and display material for the use of dealers during National Washer-Ironer Week. Shown on these and the following page are typical examples. (1) Laundry Queen, (2) Bendix, (3) Hotpoint, (4) ABC, (5) Crosley, (6) Westinghouse, (7) Kelvinator, (8) Speed Queen, (Next page) General Electric and Voss.

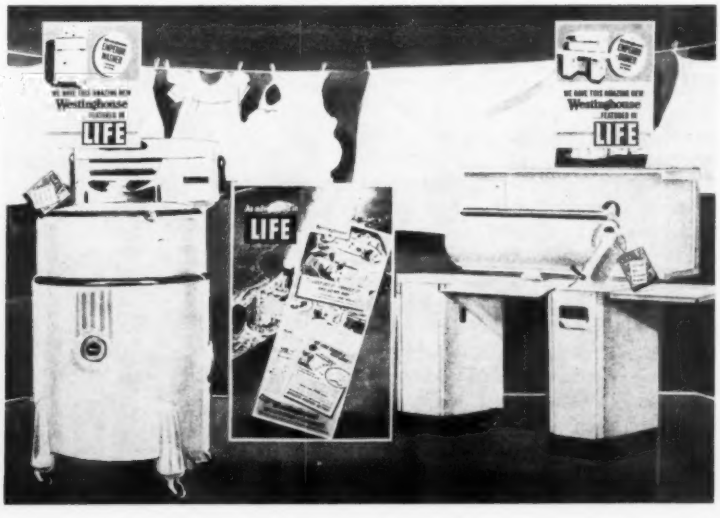
(8)

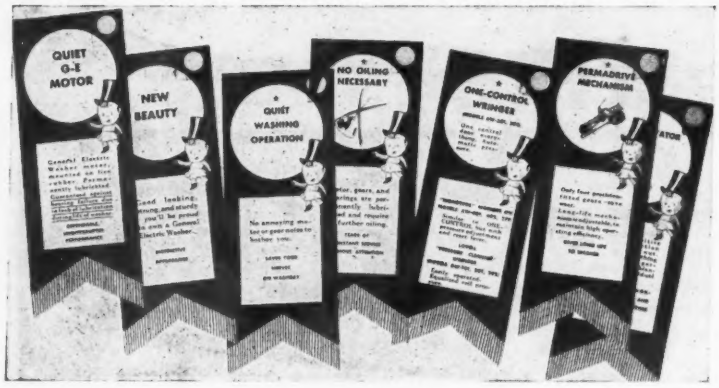
(7)



(5)

(6)





These small banners directing attention to specific features of General Electric washers are especially popular with dealers. Too often, dealers complain, manufacturers display material emphasizes brand name to such an extent that sales features are neglected. At right, an interest-compelling display card.

dry equipment before from 75,000 to 85,000 people in a single week.

The head of the load building division of the local electric utility company called together representatives from the newspapers and radio station for the purpose of discussing ways and means for promoting National Washer and Ironer Week. The utility head sent a letter to all washer and ironer dealers in the city and suburbs requesting them to cooperate with the newspapers and radio station in the form of advertising and publicity, in order to present a united front promoting the Week to the readers and listeners of these media.

The newspaper and radio station solicitors then called on all dealers to explain the proposition. The result was double page spreads in both newspapers on the Sunday the Week began with supporting publicity and radio programs featuring special values for the week by individual dealers. A mid-week page was also gotten out by one paper.

One group of dealers had previously arranged for displays in the windows of both local newspapers, which are located on well traveled streets in the heart of downtown districts, and a display in the lobby of the largest and finest movie house in town with a weekly attendance between 40,000 and 50,000.

A local department store gave two prominent windows to a display of washers and ironers, and the utility company, in addition to a window display, held a sidewalk display and demonstration with a salesman in charge. This was reported to have been very successful. Several direct sales and a long list of first rate prospects were secured from the sidewalk display alone. Nearly every dealer featured some kind of display or extra promotion during the Week.

ABC dealers, carrying this promotion still further, took advantage of the excellent Rinso cooperation during the Week and arranged tie-ups by placing actual washer models in over a dozen of the city's largest grocery and food centers. The Rinso display was built around the washer. Many grocers donated valuable windows to this promotion and were eager to cooperate.

Thus, even in outlaying sections, housewives who went to the grocery store were reminded of National Washer and Ironer Week by seeing a new, attractive washer on display at a place where they ordinarily would not expect to see such a product. The effectiveness of this cooperation was that it seemed to help every one concerned. It is estimated that between 75,000 to 85,000 of the city's 105,000 people actually saw, or were exposed to, a new washer or ironer during the Week.

The manager of the home laundry department of the utility company says, "Unquestionably National Washer and Ironer Week proved itself worthy of the extra promotion we put behind it. While we made extra sales during the Week, we feel that the general favorable impression made on both the husbands and wives in our community, as evidenced by the excellent prospects we carded, will help our salesmen close many sales in the near future that we would probably never have had otherwise."

Likewise, the manager of the appliance department of a large department store, has this to say, "It is a welcome sign to see the industry get together in this one big drive to make the housewife more conscious of her home laundry methods. Had I known that staging a National Washer and Ironer Week

(*Continued on page* 54)

Dealers willingly devote window space to washer displays when attractive backgrounds such as this one by Voss are made available.

The Football Conference Contest

An interesting contest vehicle for fall use which combines the spicy element of chance with individual sales effort.

MOST contests are primarily designed to do the job of interpreting the daily work of the sales staff into terms of some form of recreation. It should also be borne in mind, however, that, to keep contests from becoming routine, there should always be an extra "twist" or feature to each contest which makes it a little different from any other, so that contest operation does not level out into a repititious simulation of this, that or the other game or sport. Some sort of sporting or glamorous guise is a necessity, but in addition, some ingenuity should be added to the operating routine which keeps the element of chance or newness in each contest.

The seasonal element is also worth considering in scheduling contests. While not absolutely mandatory, some consideration should be given to the timeliness of contest vehicles; for instance, a football contest would be slightly out of time if staged in the baseball season, and vice versa. On the other hand, the winter months of inclement weather would be a good psychological time to spring a yachting contest or a bathing beauty contest, simply to present an agreeable contrast to daily working conditions. The time element of each contest should be analyzed, and classified as to seasonal possibilities.

For a reasonably short, snappy contest to start off the fall with new fall lines of merchandise, the Football Conference is an excellent vehicle, and contains the elements of tying in on the public interest in major football activities, as well as the organization's own operations in the contest.

Details of the Contest Plan

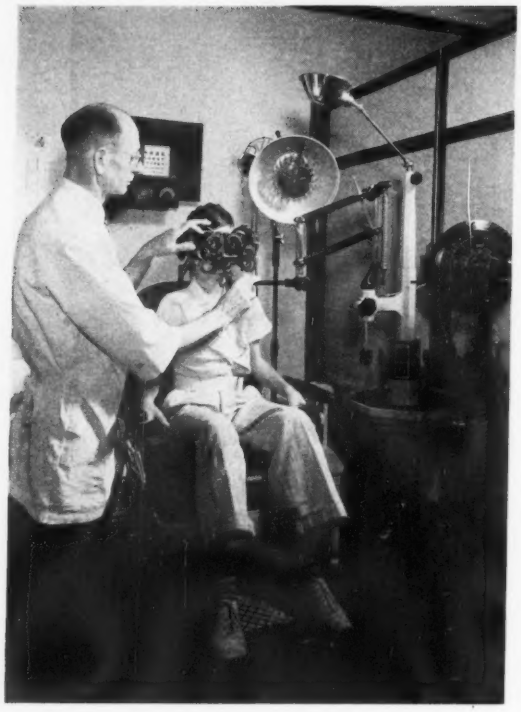
The starting outline and operating routine are fairly standard: each salesman should be allocated the name and identity of a major football team. In regions having a significant football conference, it is desirable to use the principal teams in that sectional conference; for instance, in the Southwest, no dealer would think of using any other than the teams in the Southwest Conference, letting one salesman represent the S.M.U. team, another Arkansas U., another T.C.U., and so on. If there are more men than teams, or vice-versa, additional teams from the same area can be admitted to the conference. In an area having no significant conference, the Big Ten conference might well be harnessed. Salesmen should be assigned teams by drawing lots, since some conference leaders will be more desirable than others, and the selection should be left to chance.

The contest can be operated for four weeks, six weeks, or for the duration of the football season if the prize budget will stand it. It is good psychology to have the contest end with the football season on Thanksgiving day, and cap the occasion with the awarding of the final prizes on that occasion. This can be adjusted to suit the individual contest manager's arrangements and budget.

Weekly sales totals are tabulated as in most contests, and transmuted into terms of percentage of quota. In this instance, each 25% of each man's quota represents a touchdown, or 6 points, so that a man making his full quota each week scores four touchdowns or 24 points. In addition, each two percent of his quota that he achieves over quota gives him an additional point. Thus, if Jones' quota is $200, and he turns in a volume of $250, he has achieved 125% of his quota, and scored 36 points in the football game: 24 points for his 100% of quota and 1 point for each 2% over 100.

Then on the scoreboard, there should be two spaces opposite each man's name for each week. In one of them goes his own score, as achieved by his sales. In the other, goes the combined total of his own score and that made by the team he represents in its *actual* game that week. Thus, if Jones represents T. C. U., and T. C. U. scores 12 points that week, Jones' *conference score* is his own 36 points, and his *game score* is 48, his own

(*Continued on page* 52)



For three years a comparative study of the relative costs and advantages of adequate, modern lighting for school rooms has been in progress in Joplin, Mo. Ocular changes and progress in study were watched carefully in two groups of rooms: one group equipped with the most modern lighting facilities and the other having only the traditional type equipment.

Three-Year Study Justifies

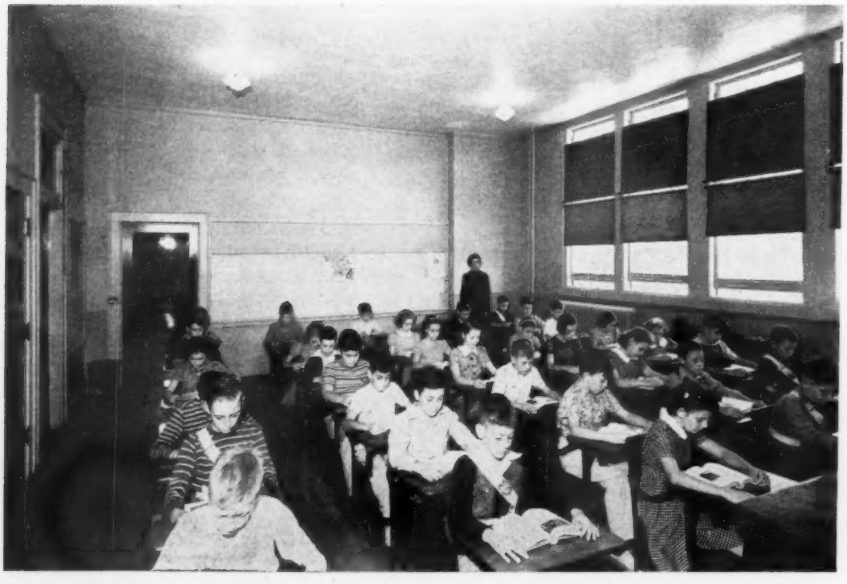
Adequate School Lighting

By Howard H. Bell

A THREE-YEAR comparative study of traditional and modern public school lighting in Joplin, Missouri, indicates emphatically that the cost of adequate lighting is justified by its results. Other indications derived from the study are that adequate lighting does affect the progress in study made by pupils, that it reflects upon both teachers and pupils by causing them to be more alert, more cheerful and more interested in their work, and that there are important ocular changes as a result of adequate lighting.

The control group was set up four years ago in four rooms in one school, two rooms retaining the traditional lighting and two with modern lighting controlled by photo-electric light meters. Each room was wired separately, with automatic indicators recording the amount of light used. Normal light ranged from two to five foot candles; modern lighting was set to be turned on when outside natural illumination dropped below twenty foot-candles at the second row of desks from the windows.

Elaborate eye tests were made by Dr. C. W. Howard, Joplin optometrist, at the start, at various



Two fifth grade rooms and two sixth grade rooms were selected for this study. All rooms were located on the north side of the school building and had approximately equal natural light from the same number of windows per room. Rooms representing the average in this school were equipped with six 150-watt lamps in prismatic glass reflectors. The two rooms equipped for adequate lighting each had six indirect luminaires. The three nearest the windows were equipped with 300-watt lamps and the three inner fixtures with 500-

times during the experiment period, and at its close. Much more elaborate testing was done by school officials to ascertain the individual benefit in schooling to the student. This included standard tests for achievement from Stanford University. Students were classified as to mental age, intelligence quotients, educational age and quotients and visual efficiency. Students with lowest visual efficiency were given seats nearer windows and relative positions were maintained during the entire three-year period. Effort was made to assess effects of home-lighting conditions on the students, in order to make the tests conclusive.

Cost of lighting, exclusive of automatic equipment, was increased around 110% in the experimental rooms, over that in the traditionally-lighted rooms. This figure is based on the amount of current, but not calculated at sliding-scale rates for quantity consumption.

Here a pupil is taking a visibility meter test. Students with lowest visual efficiency were given seats nearer windows and these relative positions were maintained during the entire three-year test.

The study was begun with two fifth grade rooms and two sixth grade rooms, one each being lighted modernly and checked against a traditionally-lighted room. On the basis approved for standard achievement tests, a gain in educational advantage of one and one-fourth months, conservatively, was recorded in each nine-month school term, the benefit of adequate lighting over traditional lighting in schools. That would amount to practically one full school year for the student from the fifth grade through high school. (It would of course call for complete rescheduling of studies to achieve that gain as a general thing). Actual increased cost at local rates was $1.94 per student per year and the actual gain per student per year was $8.51, figured on the average monthly cost of educational progress.

Other benefits included freedom from eye strain and disciplinary troubles and a lessening of the number of pupils who required fitting with glasses. First year of the test showed little relative change in disciplinary actions taken. Second year showed almost complete change; practically no disciplinary actions were needed for the sixth grade, with improvement being registered for the fifth grade. This was taken as a somewhat remarkable effect, for it is believed that "bad" students increase rapidly in "badness" from year to year through influence of both habit and experience.

Distinctly noticeable was absence of frowns, twisting of faces and such, long acknowledged as signs of study and here somewhat dis-

(*Continued on page* 51)

watt lamps. The adequately lighted rooms were also equipped with photo-electric control devices to turn on lights automatically whenever natural illumination from windows dropped below 20 foot-candles at the second row of desks. Careful tests indicate that progress of students in adequately lighted rooms was considerably greater than in the traditionally lighted rooms. Through the use of standard achievement tests it appeared that educational advantage of students in well-lighted rooms amounted to one and one-fourth months in each nine month school term.

Designing Protective Lighting For Industrial Plants

By John H. Waterbury

Illuminating Engineer
Benjamin Electric Mfg. Co.

ALWAYS a profitable field for the electrical contractor, outdoor floodlighting for protection of industrial plants and areas takes on new significance as a source of business for the contractor as industry turns to the most important job it has ever had—preparation of national defense.

From blankets to battleships and canned goods to cartridges every branch of industry is being recruited to national defense. With more than 1600 orders placed with industry by the National Defense Commission to July 1 and scores more being released daily, the number of plants which can become the target for sabotage has already reached serious proportions.

World War experience proved that *industry's first line of defense against sabotage is light.* When industry builds a fence of light around its property it erects a barrier through which no intruder dare pass. Moreover, this fence of light is of tremendous aid to guards and police as it creates a "no man's land" which can be easily patrolled and in which any suspicious person is instantly detected. Light deprives the intruder of the protection of dark corners and deep shadows upon which he relies.

How Should Light Be Used?

The purpose of protective lighting is to deter intruders from entering the property and to make them readily visible if they do enter. The amount of light and the type of distribution required to do this depends upon size of the property, number and location of buildings, the importance and vulnerability to attack of the property and the other means of protection used, such as guards, fences and alarms. Each property must be studied to determine the places which are most vulnerable and then those places should be adequately lighted. No one system of lighting will take care of all cases but one or more fundamental floodlighting principles can be applied to provide adequate protective lighting to meet most conditions.

Fencing around the property is an importan aid in protection, because the more difficult the entrance and the more conspicuous the intruder can be made if he attempts to enter, the more effective the guard can operate. Fencing should be lighted because guards cannot see in the dark and a properly lighted fence not only reduces the number of guards required but simplifies patrolling. If guards are at fixed stations it is often feasible to so locate these stations that their area of visibility is greatly increased. It is desirable where possible to have guards located in shadow so that the intruder cannot know their location and so that they may see the intruder more easily. The visibility of distant points is materially affected by the amount of light in the immediate vicinity of the guard, for if he is standing in a lighted area more light must be provided at the distant point to provide visibility.

The conventional way of lighting a fence line is to place a narrow beam 1000-watt floodlighting projector at each corner and place additional projectors approximately 300 feet apart. The projectors should all be aimed in the direction in which the guard is patrolling, so that the light does not shine in his eyes. Local conditions, such as the type of fence, the location of the guard, the method of patrolling, the size of the yard, the location of the building, and the surroundings of the yard may make a different system of lighting more effective.

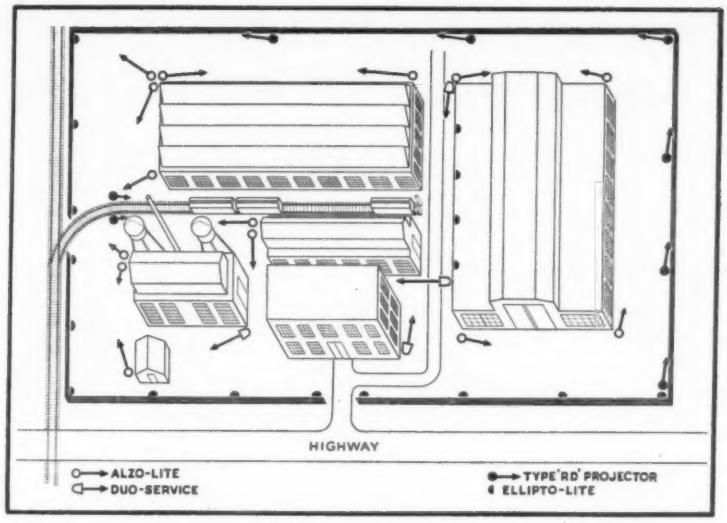
Building a Fence of Light

If buildings are close to a fence line it may be desirable to place the floodlighting projectors on the roofs of adjacent buildings and light the area up to as well as beyond the fence. If there is a wire fence and the guard is patrolling inside the fence, it may be desirable to use a wider beam projector and direct most of the light outside of the fence so that the edge of the beam is along the fence line. This leaves the guard in relative darkness and provides a wide space outside of the fence in which he can observe

World War experience proved that industry's first line of defense against sabotage is light. It not only erects a barrier through which no intruder dares to pass but is a tremendous aid to guards and police since it denies the intruder the protection of dark corners.

any intruder. If the fence is opaque it should be painted white, thus an intruder will stand out in bold silhouette against the light background. In other places as well it often is possible to lighten backgrounds which help the guards to see an intruder in silhouette.

In some cases, particularly in small yards, it is entirely feasible to light the fence line by means of local units spaced 50 to 75 feet apart. The units should be mounted high enough so that a passing person cannot easily reach up and hit the lamps with a club, putting a section in darkness. Lamp guards may be used to prevent breakage from missiles. It is necessary to place units sufficiently close together so that there is no large section in darkness to provide a place of easy access for an intruder if one lamp is broken or burned out. Close spacing is also desirable to provide the coverage necessary to reveal intruders in fog and bad weather when they are most likely to operate.



This diagram of a well lighted factory area used through the courtesy of Benjamin Electric Mfg. Co. indicates typical applications of several different types of floodlights. The designations given in the diagram refer to specific types of Benjamin floodlights. The Alzo-Lite is a general purpose enclosed floodlight; the Duo-Service light serves the dual purpose of general flooding as well as providing a higher intensity over a smaller area; the "RD" Projector is an enclosed floodlighting projector; and the Ellipto-Lite is a wide-angle porcelain floodlight.

Lighting for Vulnerable Spots

While the boundary fence is the first line of defense, there are many vulnerable areas around a property which should receive careful study to provide satisfactory lighting. Some of the most vulnerable of these are: (1) spaces along railroad tracks and highways, (2) narrow alleys between buildings, (3) narrow spaces between buildings and fence lines, (4) all entrances to yards, (5) entrances to important buildings, (6) areas where there is concealment, such as shrubbery or outbuildings, (7) near to the fence line, (8) streets that dead end at the property line.

If there are a number of freight cars parked in the yard, this is a location which should receive particular attention, because it provides a rallying point where a large group may be concealed and from which they can make sallies to do their destructive work. Piles of lumber or stacks of other material around the yard may cause a shadow in which intruders can find shelter and wait for the opportune time to strike. In spots like this small fires may be started for the purpose of distracting attention from other locations.

As industry begins work on national defense orders protective floodlighting will become an increasingly important source of business for electrical contractors. No one plan of lighting will fit all cases but most conditions are covered in a few fundamental rules.

Typical Lighting System

Reproduced on the accompanying diagram is a typical layout of a medium size industrial plant comprising an office building, several large warehouse and manufacturing buildings and several small buildings for miscellaneous purposes. The plant property is enclosed on four sides by a fence and is located fronting on a main highway with a railroad along one side and a spur track into the yard.

The primary problem in lighting this layout is fence lighting. Along the highway wide-angle porcelain enamel floodlights are used at or near the fence line pointed outwards at right angles to the highway and directed downwards to reduce possibility of glare to passing motorists. These floodlights are also used along the fence paralleling the railroad and are similarly aimed and directed to minimize glare. Floodlight projectors are indicated along the other fence lines where no glare problem is present. They should be concentrated-beam types

(Continued on page 52)

Inspectors Converge on Houston For 12th Annual Meeting

BROAD changes in the 1940 National Electrical Code, especially in connection with the many new types of insulation recognized for building wire, are expected to bring more than three hundred members of the Southern Section, International Association of Electrical Inspectors to their twelfth annual meeting in Houston, Texas, September 16, 17 and 18. Headquarters for the meeting will be established in the Rice Hotel.

Instead of the usual section by section, and article by article, discussion of the Code, it is planned to hold symposiums on each chapter of the Code. Discussion leaders for each chapter will include representatives of the manufacturers, contractors, inspectors, utilities, and insurance organizations. The discussions will be open to the entire audience and it is anticipated that general discussions from the floor will result in a better understanding of new requirements embraced by the 1940 edition of the Code.

Business Program

The first session Monday morning will include addresses by the section president, C. S. Whitaker, Durham, N. C.; K. W. Adkins, International president, St. Louis, Mo.; and Victor H. Tousley, International secretary, Chicago, Ill.

The Monday afternoon session will be devoted to a discussion of Chapter 2 of the Code. Discussion leaders for this chapter will include George Welman, Harvey N. Pye, J. G. Fisher, A. H. Schirmer, and J. L. Speights. This session will also include a special discussion on "Supplementary Grounding of Equipment Frames," conducted by George Welman, Martin C. Hughes, and Arthur L. Abbott.

Chapter 3 of the National Electrical Code will be the subject for discussion at the Tuesday morning session. Among those who will participate in these discussions will be: Howard H. Weber, Joe Schwegman, H. G. Knoderer, F. G. Camus, J. Warner Pyles, H. H. Schomburg, J. H. Eberling, E. A. Thibodeaux, J. L. Wagoner. A special feature of this session will be an address by J. L. Wagoner, Westinghouse Electric & Mfg. Company, on "Protection of Power and Lighting Circuits."

Both Chapter 4 and Chapter 5 of the Code are scheduled for discussion at the Tuesday afternoon session. Discussion leaders on Chapter 4 include J. W. Whittington, C. S. Whitaker, J. M. Flanigen, and L. F. Adams. Those who will lead discussion on Chapter 5 are T. S. King, Joe Whitner, G. G. Griffin, C. T. Jones, and A. E. Hancock.

Also scheduled for presentation at the Tuesday afternoon session is

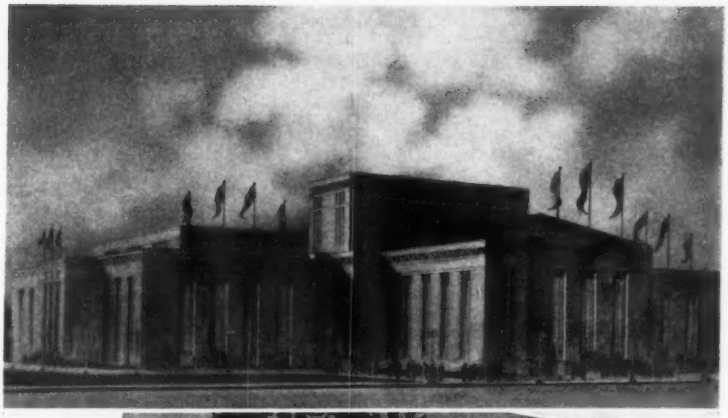
a moving picture on electrical porcelain manufacture presented by E. G. Romeiser, Porcelain Products, Inc.; and an address on "The Values of Organization" by A. Penn Denton, consulting engineer.

Two addresses will be featured at the Wednesday morning session. G. E. Manning, Underwriters' Laboratories, Chicago, will discuss recent developments in the electrical field at Underwriters' Laboratories. "How Fires and Explosions Start from Electrical Causes," will be the subject of an address by G. M. Kintz, district engineer, U. S. Bureau of Mines, Dallas, Texas. Chapter 6 and Chapter 7 of the Code will also be discussed at this session. Discussion leaders on Chapter 6 will be A. J. Bommer, J. B. McMath, E. L. Kenderdine, and D. L. Johnson. For Chapter 7, discussion leaders will be A. A. Coffin, B. Z. Segall, O. V. Summers and G. M. Miller.

The meeting will be concluded Wednesday afternoon following a discussion on Chapter 8 of the Code led by G. T. Dunn and F. C. Jurgens. Reports of committees and election of officers for the new administrative year will conclude the business sessions of the meeting.

Aside from the business features of the meeting and the attractive entertainment program that has been prepared by the local committee, delegates to this meeting will find much of interest in the city of Houston which has grown from a mud-strewn village in 1836 to the largest city in Texas, first in industrial development in the South, eighth in the nation in total build-

(*Continued on page* 48)



A busy city is the Houston of today. First in industrial development in the South; second busiest port in the nation in deep-sea tonnage; the oil capital of the world; and the world's leading spot cotton market; are some of its claims to distinction. The air view at the left shows its broad straight streets to advantage. At top right is the Sam Houston Colliseum which has one of the largest arenas in the South. At center, the San Jacinto memorial shaft marking the battlefield near Houston. Below, the ship channel and turning basin.

N. E. C. A. Florida Convention Plans Near Completion

CONVENTION committees report good progress on plans for the 38th Annual Convention of the National Electrical Contractors' Association to be held at the George Washington Hotel in Jacksonville, Florida, October 21-23.

The business program of the convention will be divided into five sessions, with each session designated to cover in general one of the five major activities of the association. The Monday morning session will cover sales development, including not only the presentation of the program of the Sales Development Committee, but also related subjects such as the national defense construction program and other problems affecting marketing of the electrical contractors' services.

The Monday afternoon session will be designated as the I.B.E.W. Employers' Section session under the direction of the NECA Labor Relations Committee.

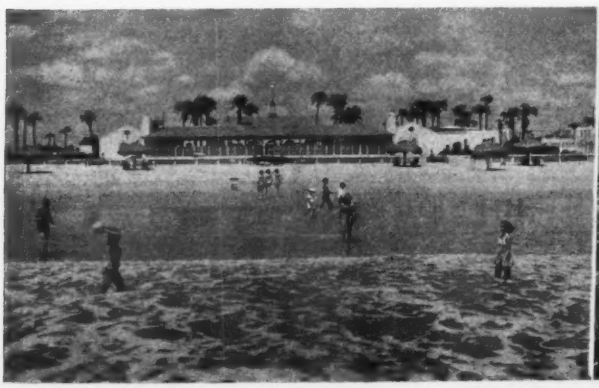
The general subject for the Tuesday morning session will be codes and standards, covering discussions of the problems involved in the new 1940 National Electrical Code, which will be ready for distribution at about the time of this convention. Tuesday afternoon will be recreation day at Ponte Vedra Beach and Country Club.

The two sessions on Wednesday will cover discussions of cost data, estimating and industry statistics. At the final business session on Wednesday there will be an election of Executive Committeemen for Divisions 1, 4, 7 and 10. The convention will close on Wednesday evening with the annual banquet and an entertainment which the Jacksonville committee assert will be a worthy finale for three perfect days.

Many delegates to the convention are planning to combine the convention trip with a pleasant week of vacationing. This will be facilitated by a six-day post-convention tour that has been arranged by the convention committee.

The tour, which will include points in Florida and Cuba, will start on the morning after the close of the convention. Modern, deluxe air-conditioned buses will carry the delegates down the East Coast of Florida with stops at interesting points. The first night will be spent at the McAllister Hotel in Miami, with sightseeing in Miami that evening and all of the next day. Friday evening the party will board the luxurious ocean liner of the Peninsula and Occidental Steamship Company, with its wide promenade decks especially designed for service in the semi-tropics and every stateroom having

(*Continued on page* 52)



One of the high points of the convention entertainment program will be the afternoon and evening to be spent at the Ponte Vedra Beach and Country Club. At left is a view of the surf and the Beach Club; at right, the Club patio.

Lower Overhead and Higher Sales

Were achieved by a pioneer Houston electrical dealer by moving out forty blocks from the down-town business area.

A DOWN-TOWN location, a close-in semi-business district, or a location in a residential section? This is a question that has been voiced by many electrical merchants and is in the minds of many others. It is a question that has been answered by D. F. Woods, president of the Woods Electric Company, Houston, Texas.

This pioneer electric merchant has been in business in Houston since 1908. Down-town locations have been occupied successfully; but as motor cars became more common, the Woods Electric Company moved to Main and Pease Street, or in the 1700 block on Main Street in this city 13 years ago.

"People today shop on wheels to a large extent," says this experienced electrical dealer. "We have only to observe Sears, Roebuck and other mail order chains. They usually have big stores located out where people can find parking space and, in fact, these firms provide ample parking facilities. We, too, have followed this trend and moved recently to our present location, some 40 city blocks from the congested down-town business district. We are in a residential section, one block over from Main Street. We lost some of the street traffic, but this loss was offset by a gain in parking facilities.

"Our main business is electrical fixtures, lamps and small appliances. We have to go after most of this business. We use three men contacting the architects, the contractors, and the home owners of the better type. Now with parking space, we find that the architects come to our display room

(Continued on page 50)

The night view of Woods Electric Company, above, shows how effectively this place of business "stands out" in a residential neighborhood even though the structure blends harmoniously with others in the immediate vicinity. The interior view shown directly above is typical of the Woods' displays. He sells the tables too!

Understanding and Using the National Electrical Code

By B. Z. Segall

New Orleans Public Service, Inc.
New Orleans, Louisiana

IN this fifteenth article of his series on the Code, Mr. Segall discusses the requirements relating to overcurrent protection, as covered in Article 240.

THE use of fuses or circuit breakers for over-current protection is dependent on their rating and their setting. Under some conditions both terms are synonymous. Thus the rating of a fuse fixes its ability to safely carry the current for which it has been designed. Its setting cannot be changed as it has a definite and fixed rating.

A circuit breaker, also, may have a fixed setting and this will represent its rating or capacity for safely carrying current. This is true of the type generally used for small branch circuit protection having a sealed thermal element designed to have a time delay tripping action. These breakers are rated for a maximum current which they will carry continuously without opening the circuit. Any value of current above this maximum will cause the breaker to open without a certain definite time depending on the amount of over-current. The capacity of the breaker cannot be changed as its setting is fixed.

A circuit breaker, however, may be so designed as to have a rating above which the breaker may not safely carry current, but may also have an adjustment whereby the breaker may be made to operate at some current value below this rated value. Many time delay, magnetic trip and instantaneous type breakers have adjustable trip mechanisms which set the breaker to operate at values other than that shown as the rating of the breaker.

Fuses and time delay, thermal trip, fixed setting relays, used as over-current protection devices must never have a rating in excess of the allowable conductor carrying capacity as explained in the preceding article. That is, these devices must offer branch circuit, motor circuit, fixture circuit, and remote control protection in accordance with the discussion outlined in this previous code exposition.

The magnetic trip, time delay and the instantaneous type of breaker if set for the same protection values as for the fuse and thermal trip breaker would open the circuit everytime the loading reached the maximum carrying capacity of the conductor. For this reason the code allows a 25% oversetting for these breakers where they are used in these various circuits.

Plug fuses are limited in their application by the code. They may be used on all circuits rated at 125 volts or less between conductors. If the circuits are fed from a system having (a) a grounded neutral, and (b) no conductor at more than 150 volts to ground then plug fuses may be used for their protection. Figures 34 and 35 illustrate these two conditions.

In general the over-current device must be placed at the point where the conductor to be protected receives its supply. Four exceptions, however, are recognized.

First, in the case of service conductors, it will be remembered that the device may be located at the point of entrance of these conductors into the building or at the outer end of the service raceway. Theoretically, according to the general code rule these devices should be at the point where the service conductors tap to the supply mains; in the case of overhead systems, on the pole, and in the case of underground mains at the point of con-

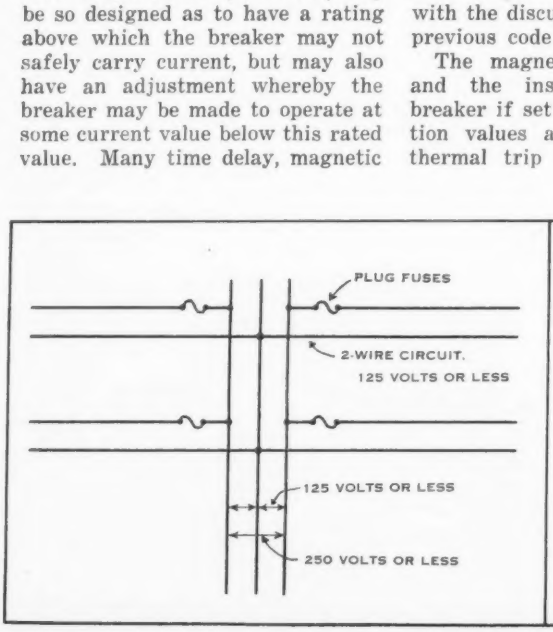


Fig. 34. (Left) These diagrams illustrate the application of plug fuses recognized by the Code. They may be used on all circuits rated at 125 volts or less between conductors.

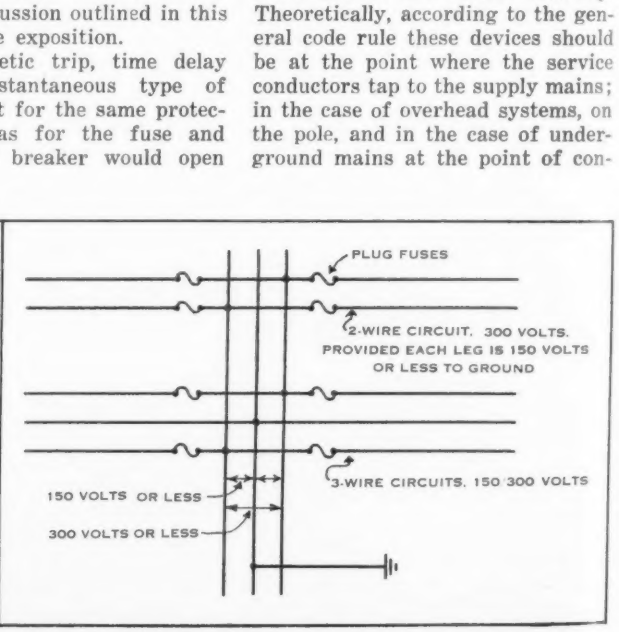

PLUG FUSES
2-WIRE CIRCUIT. 300 VOLTS.
PROVIDED EACH LEG IS 150 VOLTS
OR LESS TO GROUND
3-WIRE CIRCUITS. 150-300 VOLTS
150 VOLTS OR LESS
300 VOLTS OR LESS

Fig. 35. (Right) However they are also permissible on circuits fed from a system having a grounded neutral and no conductor more than 150 volts to ground.

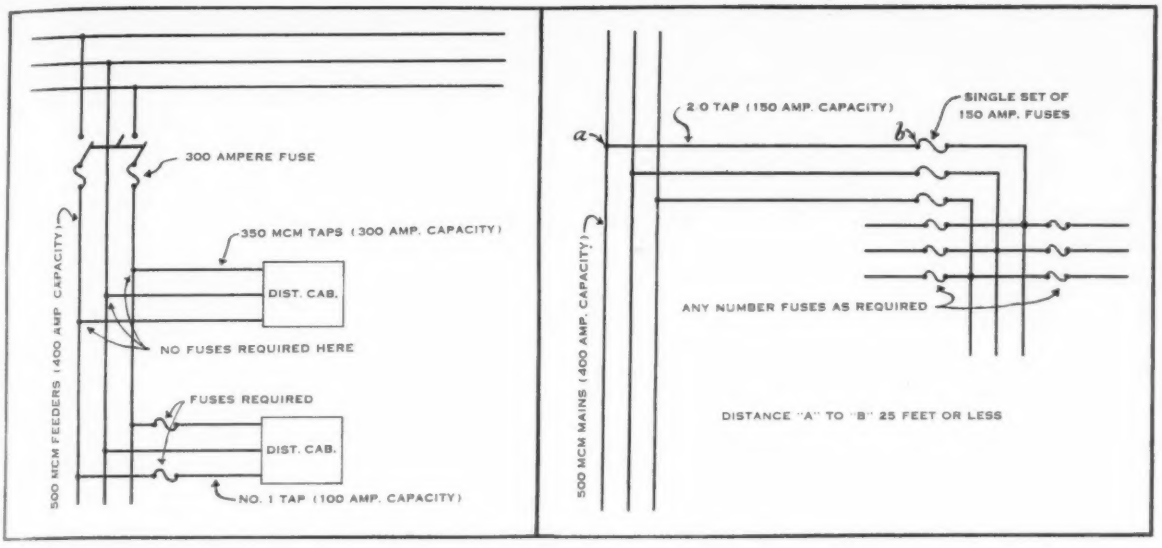

300 AMPERE FUSE
350 MCM TAPS (300 AMP. CAPACITY)
DIST. CAB.
NO FUSES REQUIRED HERE
FUSES REQUIRED
DIST. CAB.
NO. 1 TAP (100 AMP. CAPACITY)
500 MCM FEEDERS (400 AMP. CAPACITY)
2 0 TAP (150 AMP. CAPACITY)
SINGLE SET OF 150 AMP. FUSES
a
b
ANY NUMBER FUSES AS REQUIRED
DISTANCE "A" TO "B" 25 FEET OR LESS
500 MCM MAINS (400 AMP. CAPACITY)

Fig. 36. (Left) Illustrated here is one of the exceptions to the rule requiring that overcurrent protection be placed where a set of conductors receives its supply. In this instance the overcurrent devices protecting the larger conductors also protect one of the smaller tapped circuits. However, such protection is not available for the smallest tapped circuit which is only rated at 100 amperes. Fig. 38. (Right) Another exception to the general rule referred to in Fig. 36 is illustrated here. No overcurrent protection is required at "a" provided that each conductor of the tap does not exceed 25 feet in length, that the current capacity of the tap is at least 1/3 of that of the main conductors, that the tap conductors are protected from injury and that the tap conductors terminate in a single set of fuses rated at the current carrying capacity of the tap conductors.

nection of the service to the underground mains. However, this cannot be easily accomplished in most cases and the exception is practically a necessity.

A second exception provides for those cases where the overcurrent devices protecting the larger conductors, also protects the smaller tapped circuits. Figure 36 illustrates this case.

The third exception is quite involved in its intent and application. Four conditions must be met to apply this exception. In the case of a panel board or a switchboard to be tapped to a main riser feeder, the smaller conductors feeding from this main riser feeder to this switchboard or panel board do not have to be fused provided that:

(a) The length of each tap conductor does not exceed five feet;

(b) the current carrying capacity of these tap conductors is equal to the sum total current carrying capacity of all the circuits feeding from the switchboard or panel board;

(c) the tap does not extend beyond the switchboard or panel board; and, finally,

(d) the tap is enclosed in a metal raceway if not a part of the switchboard or panel board.

Condition "b" may be illustrated by referring to Figure 37. It will be noted that the 30 circuit distribution cabinet is tapped in to the 500 MCM, 110/220 volt three-wire main riser. If the branch circuits are all wired with No. 14 AWG conductors and fused for 15 amperes then the taps must have a current carrying capacity of 30/2 x 15 amperes (the capacity of No. 14 wire) or 225 amperes. No 4/0 wire will satisfy this condition. However, if No. 12 AWG wire is used for these 15 ampere circuits the taps must now be large enough to supply the capacity of all the No. 12 wire circuits even though they are protected by 15 ampere fuses. The taps now must carry 30/2 x 20 amperes or 300 amperes and 350 MCM wire must be installed.

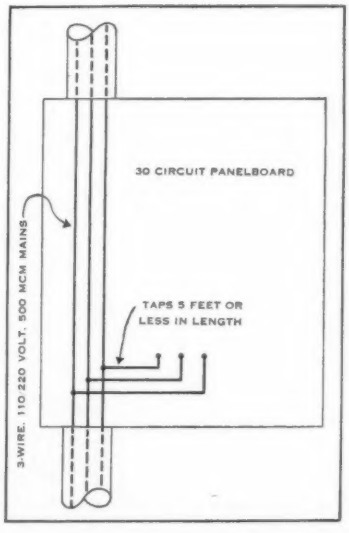


Fig. 37. Illustration of the "five foot tap rule." No overcurrent protection is required for such taps if they do not exceed 5 feet in length, if the current capacity of the taps is equal to the sum total current carrying capacity of all the circuits feeding from the switchboard, if the tap does not extend beyond the panelboard, and finally, if the tap is enclosed in a metal raceway when not part of panel.

Finally an exception is made to the general over-current rule stated above if the following four requirements are satisfied:

(a) each conductor of the tap does not exceed 25 feet in length;

(b) the current carrying capacity of the tap conductors is equal to ⅓ or more the capacity of the main feeders;

(c) the tap conductors are protected from mechanical injury; and

(d) the tap conductors terminate in a single set of fuses rated at the current carrying capacity of the tap conductors.

Figure 38 shows all these conditions. The main feeders are 500 MCM. Therefore, the taps must be capable of carrying at least ⅓ the current rating of the 500 MCM cable, that is, ⅓ x 400 amperes or

(*Continued on page* 50)

MOTOR Service

Connecting Diagrams for Lap Wound A-c Motors

Part 15

By A. C. Roe

Railway Motor Engineer
Westinghouse Electric & Mfg. Co.

WITH this article are presented the last of the eight-pole connecting diagrams. Fig. 43 is the eight-parallel star, three-lead diagram, and Fig. 44 is the eight-parallel, delta three-lead diagram.

In addition, we will present some pertinent data on insulation indexing for a-c motors as recommended by the National Electrical Manufacturers' Association. This is an important phase of motor repair work as anyone can now write his own specifications as to type of coils and windings required in any repair job, and it is good policy for a repair shop to indicate the NEMA index of the coils used when billing a customer for a repair job. When coils are purchased for a repair job from the original manufacturer it is well to know the NEMA index.

The insulation applied to the coils of the various types of armature, stator, rotor, and field coils used in rotating electrical machinery covers a wide range. To protect buyers of renewal-part coils, the Coil Insulation Committee of NEMA has established a standard indexing system for designing insulation symbols for such coils.

All members of NEMA use these symbols in negotiating and in marking all shipments. In this way a purchaser can know exactly what kind of coils any listing indicates; whether the conductors are covered with Class O, B, or A insulation; whether the coil will fit the slot without further additional material or processing; whether a coil has been dipped or baked before leaving the factory; and, finally, just what kind of material is used.

Basic Features

For convenience all coils are divided into two groups: first, for direct-current armature, alternating-current stator and slip-ring rotor coils, see Table I; and second, for direct- and alternating-current field coils, see Table II.

In each of these tables the first letter of the index is the American Standards Association classification symbol for the conductor insulation and indicates the type of insulation used on the wire. The second letter covers the type or absence of insulation used on the slot section of the coils to protect it from ground (ground insulation). The third denotes the type or absence of insulation used as a binder or finish-

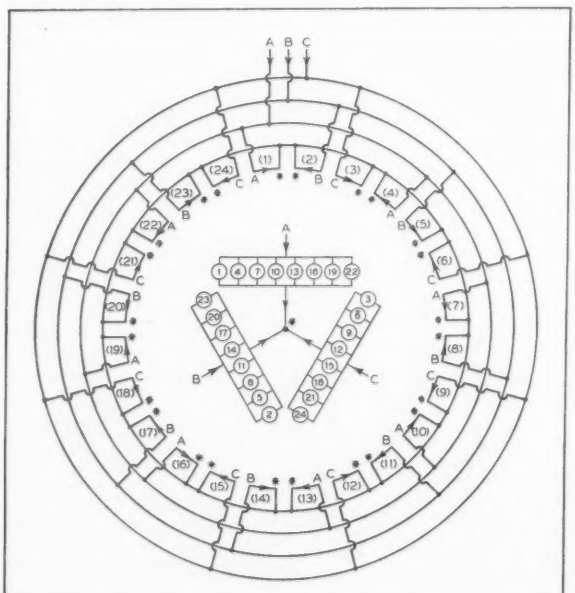


Fig. 43. Diagram for eight-pole, three-phase, eight-parallel star connection with three leads.

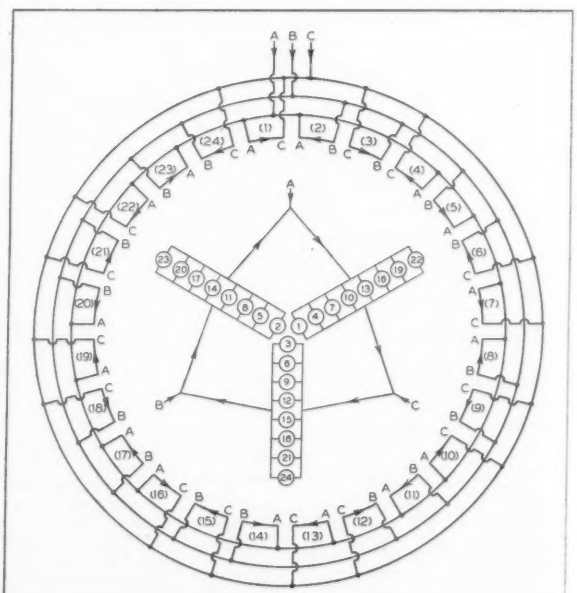


Fig. 44. Diagram for eight-pole, three-phase, eight-parallel delta connection with three leads.

Table I—Coil Indexing for D-c Armatures and A-c Stators and Slip-Ring Rotors

Index				Class of Insulation		
		Vacuum & Pressure Impregnation				
Non-Slot Size	Slot Size	Non-Slot Size	Slot Size	Conductor	Ground	Binder
AAA	AAAX	AAAV	AAAXV	A	A	A
AAO	AAOX	AAOV*	AAOXV*	A	A	O
ABA	ABAX	ABAV	ABAXV	A	B	A
ABO	ABOX	ABOV*	ABOXV*	A	B	O
ABB	ABBX	ABBV	ABBXV	A	B	B
ANN	.....	.....	.....	A	N	N
ANA	.....	ANAV	.....	A	N	A
ANO	.....	ANOV*	.....	A	N	O
AOO	AOOX	.....	.....	A	O	O
BBB	BBBX	BBBV	BBBXV	B	B	B
BAA	BAAX	BAAV	BAAXV	B	A	A
BAO	BAOX	BAOV*	BAOXV*	B	A	O
BBA	BBAX	BBAV	BBAXV	B	B	A
BBU	BBUX	BBUV*	BBUXV*	B	B	U
BBO	BBOX	BBOV*	BBOXV*	B	B	O
BNN	.....	.....	.....	B	N	N
BNB	.....	BNBV	.....	B	N	B
BNA	.....	BNAV	.....	B	N	A
BNO	.....	BNOV*	.....	B	N	O
BNU	.....	BNUV*	.....	B	N	U
OOO	OOOX	.....	.....	O	O	O
OAA	OAAX	.....	.....	O	A	A
OAO	OAOX	.....	.....	O	A	O
OBA	OBAX	.....	.....	O	B	A
OBO	OBOX	.....	.....	O	B	O
ONN	.....	.....	.....	O	N	N
ONA	.....	.....	.....	O	N	A
ONO	.....	.....	.....	O	N	O

ing tape. The symbol N indicates the absence of ground or binder. The fourth and fifth indicate other differentia, as explained later.

The letter X is an example of the use of a fourth symbol. It indicates coils that fit the slot without the use of any additional insulating material or winding cells. Slot-fit or X-coils must be held to closer tolerances, are pressed to size, and require less time and material during winding. Slot-size coils, though more expensive, will in many cases show a saving if all winding factors are considered.

To distinguish between coils dipped in varnish in open tanks and those treated by the vacuum-dry, pressure-fill method, the letter V is used to indicate the latter method. It occurs in fourth or fifth place, depending on whether the coil is an X-type.

The letter O in Table I under the heading "Binder" denotes that the coils are not treated with varnish after applying the binding or finishing tape. Such coils are sometimes called green or undipped coils. The letter O denotes at the same time the use of class O insulating material, such as untreated cotton, cambric, or silk tapes. The letter U under the same heading denotes the use of asbestos finishing or binding tape on coils that are not treated with varnish after the application of the binding tape. Thus the letter U indicates a class B binder material.

Conductor Insulation

The conductor insulation—material used to cover the bare copper wire, ribbon, or strap used in forming the individual coils—can be applied before, while, or after forming the coil. In general, the term *wire* or *ribbon* denotes that the conductor is insulated before forming the coil; the term *strap* indicates that the conductor is insulated during or after the forming of the coil.

The indexing symbols used in Tables I and II are based on the use of classes O, A, and B insulating materials; and Table III lists under three headings the various types of materials commonly used for conductor insulation.

Class O Material, Table III, includes all of the wires using untreated coverings.

Class A Material covers materials considered as class A when used in coils that do not receive any further varnish treatments. Now, it must be noted that some of the material in class O falls into class A under certain conditions. A coil may be insulated with class O material and then treated in varnish after being formed—before the ground and binder are applied. In this case the insulation becomes class A.

Class B Materials, Table III, are not dependent upon varnish treatment for classification, and regardless of what other letters are used in the coil index, the letter B for conductor insulation indicates only the materials indicated. It is important to remember that class B is the highest grade of insulation, class A next, and class O the lowest permissible grade in use. Unless this order of superiority is kept clearly in mind, the symbols might be confusing.

Table II—Coil Indexing for A-c and D-c Field Coils

Index		Class of Insulation		
Dipped Treatment	Vacuum and Pressure Impreg.	Conductor	Ground	Binder
AAA	AAAV	A	A	A
AAB	AABV	A	A	B
ABB	ABBV	A	B	B
ABA	ABAV	A	B	A
ANN	ANNV	A	N	N
ANA	ANAV	A	N	A
BBB	BBBV	B	B	B
BAA	BAAV	B	A	A
BAB	BABV	B	A	B
BBA	BBAV	B	B	A
BNN	BNNV	B	N	N

Table III—Classification of Conductor Insulation

Class O	Class A	Class B
Single Cotton Covered Wire	Enameled Wire	Asbestos Insulated Wire
Double Cotton Covered Wire	Single Cotton & Enamel	Asbestos Paper
Silk Covered Wire	Double Cotton & Enamel	Asbestos Tapes
Paper Insulated	Silk & Enamel	Asbestos Cloth
Cotton Taped Conductors	Paper & Enamel	Asbestos Sleeving
Silk Taped Conductors	Cellophane & Enamel	*Mica Tapes
Cotton Sleeving	Cellophane Insulated Wire	Glass Insulated Wire
	Treated Tubing	Glass Tape
	Treated Tapes	
	Treated Papers	
	Treated Silk	

* This includes the various combinations such as paper and mica, cellophane and mica, cambric and mica, glass and mica, etc.

Ground Insulation

Insulation applied to sections of the coils coming in contact with iron parts of the apparatus, used mainly because of its dielectrical value to prevent breakdown to ground, is termed ground insulation. It is divided into two groups: first for armature, rotor, or stator coils; and second, for field coils. This grouping follows Tables I and II, and the distinction is due to the different methods and materials used.

Group 1 is generally used on the straight parts or slot sections of the coils. This slot or ground insulation is placed on the coil after forming and before applying the finishing or outside binder tape.

Thus any coil index in Table I in which the second letter is A, B, or O indicates the use of ground insulation on the coil; whereas, if the second letter is N, it means that no ground insulation is used on the coil itself. This distinction is one of the most important details of the indexing system, as any coil employing the letter N in the second place of the index will require the use of considerable more slot insulation during their installation in the core.

Group 2 covers field coils in which the ground insulation is applied to a greater portion of the coil, as each coil must be protected from all four sides of the pole piece, the pole tip or horn, and from the frame. This insulation may be tape, washers, or sheet material cut into various shapes, or combinations of any two of these forms. In Table II three coil indexes having N for the second figure, are listed. The letter indicates that no ground insulation is used and that additional material will in most cases be required to install the coils in the frame.

Three classes of insulation—O, A, and B—are listed in Table IV. When coils using class O ground insulation are treated in varnish after the ground and binder are in place, the material does not change from class O to class A. However, if the coils are treated by the vacuum-dry and pressure-fill method, after the ground and binder insulation is in place, then all class O material whether conductor, ground, or binder, is changed to class A.

Binder Insulation

The material used as the outer covering on a coil to bind the conductors and ground insulation in place, or in the absence of ground insulation, to bind the conductors together, is called binder insulation. It is generally applied in the form of tape. On field coils it may be washers, sheet material cut into various shapes and held with tape, cements, etc. When the letter N is used in the third place of a coil index, Tables I and II, it is also used in the second place. Coils thus classified are simply conductors held together with string, varnish, or cements. In most cases such coils are conductors wound to shape and held in loose bundles of wire with a few string bands.

The three classes of binder insulation are listed in Table V but in field coils this insulation might also be of the kind listed in Table IV. When Class O materials are indicated by the third letter of a coil index, the coil is not treated in varnish after applying the ground and binder insulation. Class A materials, such as the common tapes, are generally applied in the untreated state, or as class O material and then the finished coil treated in varnish by either the dip or vacuum-pressure method. Class B materials when used as binders for armature coils are glass or asbestos tape, but for field coils they may be of the materials listed in the third columns of Tables IV and V in various combinations.

Two methods are used to impreg-

(*Continued on page* 48)

Table IV—Classification of Ground Insulation

Class O	Class A	Class B
Untreated Papers	Treated Cloths	Mica
Fishpaper	Treated Cambrics	Mica & Paper
Fullerboard	Treated Silk	Mica & Cambric
Untreated Cambrics	Treated Papers	Mica & Cellophane
Untreated Cloths	Cellophane	Asbestos & Mica
Untreated Silk	Micarta	Asbestos & Paper
Wood	Treated Wood	Asbestos Base & Micarta
Fiber	Moulded Materials	Moulded Material & Asbestos or Mica Filler, etc.
		Glass & Mica

Table V—Classification of Binder Materials

Class O	Class A	Class B
Cotton Tapes	*Treated Cotton Tape	Asbestos Cloth
Silk Tapes	*Treated Silk Tape	Asbestos Tape
Cambric Tapes	*Treated Cambric Tape	Glass Tape
Surgical Tapes	*Treated Surgical Tape	
Webbing	Treated Webbing Tape	
	Friction Tape	
	Rubber Tape	
	Treated Paper Tape	

* These are generally applied in untreated form, then the finished coil is varnish treated, changing the classification to "A."

HOTPOINT'S STANDARD
OF LEADERSHIP IN WATER HEATING
DID NOT HAPPEN BY ACCIDENT

There are 5 good reasons why Hotpoint has been accepted as the *standard* of leadership in electric water heating—both by the industry and the public.

1 Leadership in Design

Hotpoint has pioneered and improved the design of electric water heaters to bring about the present high standards of efficiency.

2 Leadership in Manufacture

As America's largest producer of electric water heaters, Hotpoint maintains leadership through constant research, improved methods, skilled craftsmanship.

3 Leadership in Marketing

Hotpoint has accepted the charge of sighting logical markets for electric water heating and laying plans for exploiting the opportunities.

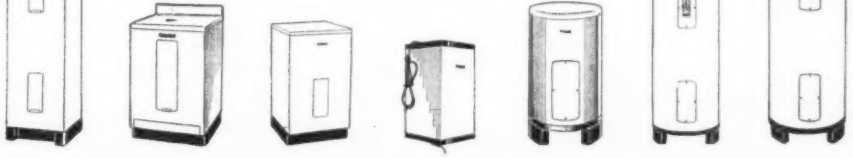
4 Leadership in Advertising

Sensing a coming boom in home building, Hotpoint launched, in 1940, the first national advertising campaign for electric water heaters. This advertising was directed to the most logical water heater prospects in the world—the people who are planning to build or modernize their homes. Already this advertising has developed hundreds of prospects for Hotpoint retailers and utility customers.

5 Leadership in Promotions

has fallen to Hotpoint as a natural result of our having a bigger stake in the water heater business than any other manufacturer. Look to Hotpoint first for the latest in promotions.

These are some of the models from Hotpoint's complete line of Water Heaters. A size for every purse and purpose.



EDISON GENERAL ELECTRIC APPLIANCE COMPANY, INC., 5614 W. Taylor St., Chicago, Ill.

Y HOTPOINT SETS THE STANDARD

od, Hotpoint's airtight heat-unit, is immersed directly in ater inside the tank. All heat rated is delivered to the water. aste. No flame. No fire hazard.

"Safe-T-Seal" Bond for d is a non-conducting mate-or sealing Calrod water heat-nits. It greatly increases the f the unit and reduces possi-y of interruptions in water r service.

rmosnap, Hotpoint's auto-temperature control is the in" of the water heater. Auto-cally turns the heating units d off as necessary. It makes oint *safely* automatic.

AUTOMATIC ELECTRIC **Hotpoint** WATER HEATERS

CTRIC RANGES • REFRIGERATORS • WASHERS AND IRONERS • CLOTHES DRYERS • DISHWASHER-SINKS

CAMPAIGNING ON A PLATFORM THAT EVERY HOMEMAKER WILL ENTHUSIASTICALLY ENDORSE
PERSONAL LIBERTY IN THE AMERICAN KITCHEN
LOWER TAXATION ON THE FAMILY BUDGET
ECONOMY IN THE HOUSEHOLD BUDGET

HOTPOINT'S NEW

Climaxing a Series of Great Hotpoint Selling Programs the New Presidential Campaign Is Tied in with the Exciting Presidential Electi

THE PROGRAM IS COMPLETE WITH

1 National Advertising
in leading magazines—*American Home, Better Homes and Gardens, Bride's, Electricity on the Farm, Good Housekeeping, House Beautiful, Ladies' Home Journal, McCall's,* featuring Hotpoint's New President Electric Range.

2 New Direct Mail
available for localized activity.

3 New Store Displays
with the touch of showmanship that interests and sells prospects.

4 New Election Banners
for display purposes.

5 Newspaper Campaign
based on Presidential theme.

6 Posters
—better than ever before.

7 Movie Promotion
"Blame It On Love." New plans for exploiting this powerful sales medium.

8 Special Sales Promotion Package Deal
A balanced selection of material for an active campaign.

Men Build Character

At Hotpoint we have an idea exchange in the form of get-togethers where each fellow learns something about the other man's job. In this way our folks get to know each other.

One of our customers once said to our Plant Manager: "What do you think is the best thing about Hotpoint products?"

The Plant Manager knew all our salespeople, engineers and factory men through our get-togethers. He thought a moment, then replied:

"It's character! Our men are good craftsmen with good character. Good craftsmen always build their character into the merchandise they produce. Thus, the best thing about Hotpoint products is the good character our men build into them."

The good character in Hotpoint products is one reason why they give satisfactory service to 17,000,000 families.

Vice-President

New Friendly Finance Plan makes buying and selling easier

Hotpoint ELECTRIC RANGES

ELECTRIC RANGES · REFRIGERATORS · WATER HEATERS · WASHERS
IRONERS · CLOTHES DRYERS · DISHWASHERS · ELECTRASINK

ADEQUATE DEFENSE AGAINST WORK, RRY, T
SOCIAL SECURITY FOR MODERN HOMEMAKERS
PREPAREDNESS FOR UNEXPECTED GUESTS
PRIVATE INITIATIVE IN PREPARING DELICIOUS MEALS
NO ENTANGLEMENTS IN MEAL PREPARATION

RESIDENTIAL CAMPAIGN

FEATURING THE

New President

ELECTRIC RANGE

ONSORED by George A. Hughes—Father of the Electric Range, and chief executive of Hotpoint—the *President* ds as Hotpoint's ultimate achievement in Electric Range e, and comes as a culmination of thirty years of progress fitting tribute to Mr. Hughes' steadfast leadership.

his range will pull a record ballot wherever value gets ote. So don't delay—climb on the Hotpoint Profit Band-on *now!*

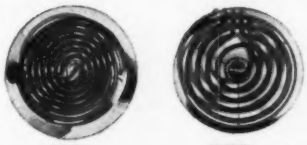
erica's choice for 1940" has these FEATURES:

- **w streamlined design**
- **ll-porcelain finish inside and out**
- **w, massive, streamlined Backsplasher**
- **w streamlined Handles of moulded white Plaskon**
- **w Indicating Switch Buttons**
- **w smartly styled Cooking Top Lamp**
- **w 3-heat 6-quart Thrift Cooker with Flavor-Seal Lid**
- **New Calrod Surface Cooking Units (each with Measured Heats)**
- **versized all purpose oven with 5 Measured Heats**
- **ree large utility drawers**

your distributor or write today for complete information. on General Electric Appliance Co., Inc., 5614 West Taylor et, Chicago, Illinois.

It's a Presidential Year . . .
Make it your most profitable one

ONLY $129.95 LIST
AT THE FACTORY
Freight and Installation Extra



OLD **NEW**
YOU CAN SEE THE DIFFERENCE

NEW CALROD

Cooking Units are faster, more efficient, more economical than ever.

Reduced coil length in the new Calrod provides faster heating; coils are self-cleaning. Be sure to get the *New Calrod Cooking Units.*

ENGINEERING SECTION

Distribution System Economics

Part 1—Methods of Making Comparisons

By P. E. Benner

Central Station Department
General Electric Co.

DISTRIBUTION economics is conventionally considered as the method of determining how to get the most from the money invested in the distribution system. The distribution of electric energy over an ever changing area, to an ever changing number of customers, having an ever changing demand, at the lowest possible cost consistent with good service, is no simple problem. The solution of the problem is in terms of electric circuits of certain sizes and voltages, substation transformers, feeder voltage regulators, oil circuit breakers, lightning arresters, cutouts, distribution transformers, and a variety of mechanical devices necessary for the installation of this equipment. The large number of component parts makes possible a large number of possible combinations of these parts and several solutions of the problem itself.

The large savings resulting from economical design are usually an accumulation of many small savings which in themselves may seem unimportant. The accumulation of small savings may be readily appreciated by keeping in mind the large numbers of the various parts involved. Based on average yearly consumption per customer in a residential area having a load density of about 600 kw per square mile, each sq. mile of area served will require in the order of 2000 services and meters, 50 to 100 distribution transformers, 1000 or so poles, approximately 100,000 ft. of secondary circuits, and 75,000 ft. of primary circuit. In addition to the savings to be obtained from the careful study of the installation costs of the various component parts, large savings are possible, by selecting the proper combinations of these various parts.

In order to decide which of several possible combinations is best, it is necessary to have some basis for judging the merits of each. Service and cost are the two basis for comparing different arrangements or plans. Usually in studying the problem of how best to serve a given area several plans are developed with the idea of providing the same quality of service to the ultimate consumer. The basis of comparison is then entirely a matter of cost with due consideration being given to such factors as the use of existing equipment or other facilities.

Evaluating Service

A more difficult problem is that of evaluating service when it is necessary to compare plans which obviously do not provide the same quality of service to the consumer, or in determining just how good service can economically be provided for a certain group of customers. The evaluation of service in dollars and cents can at best be only approximate, in as much as it involves placing values on such things as customer good will.

In attacking the problem of determining what quality of service can be given economically to a certain group of customers, it is suggested that the starting point be taken as the investment required for the system which would provide an absolute minimum from the standpoint of service in as much as this amount of investment is assumed when it is decided to serve the group of customers in the first place. From this point the matter of additional investment for providing improvements in service should be noted and compared with the benefits such as increased revenue and more rapid load growth that can reasonably be expected to result. Continuity and voltage regulation are the two important measures of electric service. Electric service that is reliable in regard to continuity tends to increase the use of and the dependence upon electrical appliances. Good voltage conditions insure satisfactory operation of the appliances and normal revenue for the operating company. Experience has shown that good service is fundamental to normal growth. Just what good service is in terms of continuity and voltage regulation is rather common knowledge. However, to be specific, the

Table I—Present Values of $1 Investments to be Made "N" Years from Now at Certain Rates of Interest

N	3%	3½%	4%	4½%	5%	5½%	6%	6½%	7%	8%
1	.9708	.9661	.9615	.9569	.9523	.9478	.9433	.9389	.9345	.9259
2	.9425	.9335	.9245	.9157	.9070	.8984	.8899	.8816	.8734	.8573
3	.9151	.9019	.8889	.8762	.8638	.8516	.8396	.8278	.8162	.7938
4	.8884	.8714	.8548	.8385	.8227	.8072	.7920	.7773	.7628	.7350
5	.8626	.8419	.8219	.8024	.7835	.7651	.7472	.7298	.7129	.6805
6	.8374	.8135	.7903	.7678	.7462	.7252	.7049	.6853	.6663	.6301
7	.8130	.7859	.7599	.7348	.7106	.6874	.6650	.6435	.6227	.5834
8	.7894	.7594	.7306	.7031	.6768	.6515	.6274	.6042	.5820	.5402
9	.7664	.7337	.7025	.6729	.6446	.6176	.5918	.5673	.5439	.5002
10	.7440	.7089	.6755	.6439	.6139	.5854	.5583	.5327	.5083	.4631
11	.7224	.6849	.6496	.6161	.5847	.5550	.5267	.5002	.4751	.4289
12	.7013	.6618	.6247	.5896	.5568	.5260	.4969	.4697	.4441	.3972
13	.6809	.6394	.6006	.5642	.5303	.4986	.4688	.4410	.4150	.3677
14	.6611	.6178	.5775	.5399	.5051	.4726	.4422	.4141	.3879	.3405
15	.6418	.5969	.5553	.5167	.4810	.4480	.4172	.3888	.3625	.3153

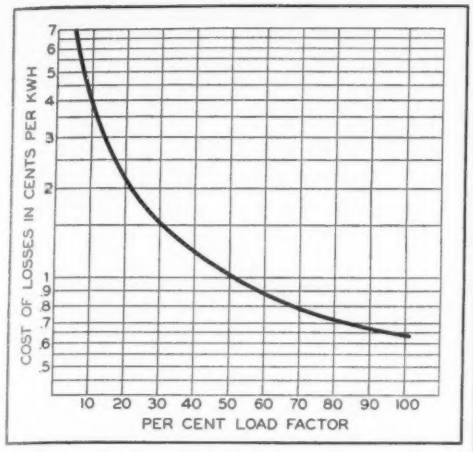


Fig. 1. (Above) Relation between the cost of energy losses in a distribution system and the per cent load factor of losses.

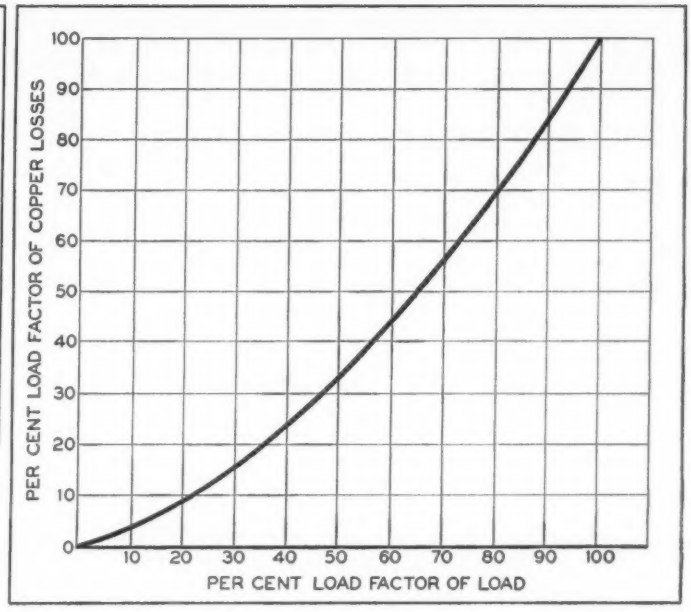


Fig. 2. (Right) Relation between the load factor of copper losses and the load factor of the loads that cause them.

voltage should not exceed the limits of plus or minus approximately 3% and the average customer minutes of outage per customer per year should not exceed 5 or 10 at the most.

Duplicating the equipment for improving reliability may be regarded in somewhat the same light as purchasing insurance, and careful consideration should be given to the matter to be sure that the premium paid is not too high. How much of an expenditure is justified to provide against the failure of any particular part of the system or equipment depends on the probability of failure and the resulting customer outage.

Failure Probabilities

The probability of failure should be determined from records on similar equipment. The failure rates are usually expressed in terms of % per year and faults per mile of line per year. To determine the effect of the failure rate of a particular piece of equipment on the average minutes of outage per customer per year, it is simply necessary to multiply the failure rate by the minutes the equipment would be out of service, or cause service interruption in case of failure, and divide by 100.

To illustrate, assume the failure rate of distribution transformers is 2% per year, and that the average length of outage caused by a transformer failure is ninety minutes. The average outage in minutes per customer per year due to distribution transformer failure would then be equal to 2 x 90 divided by 100 or 1.8 minutes. Just what might be done to decrease the number of transformer failures would of course depend on the cause of the failure. Whether it would be economical to undertake any program to decrease the number of transformer failures would be determined by a comparison of the evaluation of the cost of the transformer failures and customer outage with the cost of the remedial measure.

There are many ways of decreasing customer outage. These include tree trimming, keeping the slack out of overhead lines, careful coordination of fuses and relays, providing reclosing breakers and cutouts, providing lightning arresters for distribution transformers, interconnecting lightning arrester grounds with the secondary neutrals, designing the system with less load per circuit, providing spare substation transformers, providing multiple high voltage feeders for the substations, using loop feeders with automatic sectionalizing devices, interconnecting the distribution transformer secondaries, and many others.

In order to decide between the various possible remedial measures when considering the problem of improving service continuity it is necessary to make use of records on equipment operation to determine the principal causes of outage. Records are therefore of fundamental importance in solving economic problems of this type, and their importance in planning for better efficiency in distribution systems cannot be over-emphasized.

Maintaining the correct utilization voltage at the customer's premises insures satisfactory operation of the customer's lights and appliances and assures normal revenue from the use of these lights and appliances. The evaluation of voltage conditions in economic comparisons involve these two factors. To attempt to assign a dollar value to customer good-will created by satisfactory operation of lights and appliances would at best be only a guess.

The effect of voltage on revenue is somewhat more tangible in that actual experience has demonstrated that increased revenue accompanies improved voltage conditions. In making such evaluations, a figure of $40 per year increased revenue per 100 kva of yearly peak load for each 1% which the average voltage level is increased at peak load is suggested. To illustrate, a 5% increase in the average voltage at peak load of 500 kva would result in a $1000 yearly increase in the revenue from that load. This figure applies to residential loads and was derived as a result of a careful study of the characteristics of residential loads based on an average kilowatt-hour consumption of approximately 800 kwh per customer per year. Increased revenue was figured at 3c per kwh.

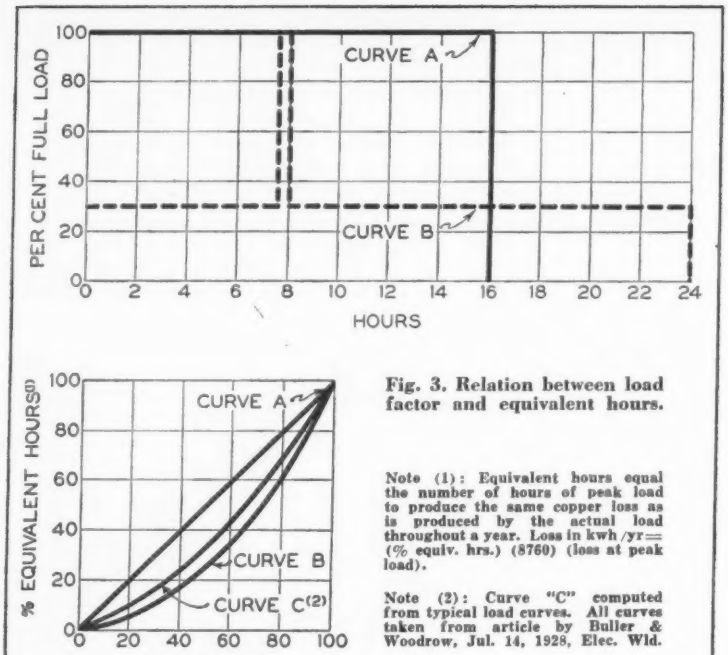


Fig. 3. Relation between load factor and equivalent hours.

Note (1): Equivalent hours equal the number of hours of peak load to produce the same copper loss as is produced by the actual load throughout a year. Loss in kwh/yr = (% equiv. hrs.) (8760) (loss at peak load).

Note (2): Curve "C" computed from typical load curves. All curves taken from article by Buller & Woodrow, Jul. 14, 1928, Elec. Wld.

Making Cost Comparisons

It is important to always keep in mind that a distribution system is continually changing with respect to the amount and location of the load. It is not sufficient to design a system for a certain load, and when that load has been realized to go about designing it all over again for some other load. The system should be designed on the basis of providing most economically for an increasing load with preference being given to a plan for providing increased capacity in increments which result in a minimum of unused capacity at any particular time. Such a method has the advantage of requiring the least amount of guesswork in regard to load growth, and also usually does not involve any very large expenditure in a limited period of time.

The actual expenditure for any particular plan may be spread out over a number of years so that in making an equitable comparison of the total investments required for different layouts it is necessary to refer all the expenditures to the same year. This is accomplished by making use of a device known as a "present value of $1 table," see Table I, in which the present value of $1 invested at some time in the future is obtainable for various interest rates. To illustrate the use of Table I suppose that two plans under consideration call for the ultimate investment of the same amount of money, say $10,000, but in one case it would be necessary to invest $5000 immediately and $5000 5 years from now, whereas in the other plan it would be necessary to invest $1000 each year for a period of 10 years. Assuming an interest rate of 4%, the present value of the total investment for the first plan would be $5000 + ($5000 × .8219), which would make a total of $9110. In the other case the present value of the total investment would be ($5000) × (1 + the sum of the figures under the 4% column from N = 1 to N = 9 inclusive). This amounts to a total of $8434.

Operating costs must also be included in making a fair comparison of 2 or more different plans. The operating or yearly cost includes the carrying charge of the investment and the cost of the losses incident to that particular plan. The carrying charge is usually of the order of 10 or 12 per cent of the investment and includes interest, taxes, insurance and depreciation. As in the case of investment, the yearly operating costs should be referred to the same year by making use of the present value of $1 table.

The actual value of losses in the distribution system depends on that characteristic of the losses which is called the load factor. Load factor is defined as the ratio of the average value of a load over a certain period to its peak value in that same interval. Fig. 1 shows the relation between the cost of losses in a distribution system and their load factor.

Evaluation of Losses

Distribution system losses include copper loss and core loss. For all practical purposes core loss is a constant loss, that is, it is the same 24 hours a day and 365 days a year. Its load factor is therefore 100% and it is charged off at the lowest rate per kwh. Copper losses on the other hand vary as the square of a load, and their load factors as shown by Fig. 2 are even less than the load factors of the loads which cause them.

The actual number of kwh of copper loss for a period of time can be calculated from the load curves for that same period of time, but this is quite a tedious process when the load varies throughout the day in the usual manner. In order to simplify the calculations involved in the determination of copper losses a factor known as the "% equivalent hours" has been derived. (Buller & Woodrow—July 14, 1928 El. Wld.) This term "equivalent hours" is defined as the number of hours of peak load necessary to produce the same copper loss as is actually produced by the load over the selected period of time.

The % "equivalent hours" was found to be quite closely related to the load factor of the load. A study was made of this relationship by analyzing a large number of typical load curves, and as a result Curve C, Fig. 3, was obtained, which shows the average relation between the % equivalent hours and load factor. Maximum and minimum values of % equivalent hours are indicated by Curves A and B which represent the load curves also shown in Fig. 3. The value of the % equivalent hours to be used in any particular calculation can be varied from that obtained from Curve C when the load curve of the load under consideration appears to display a marked similarity to either Curve A or B.

The use of Fig. 3 for determining the % equivalent hours requires knowing the load factor of the load causing the losses. One convenient and frequently used method is to

(*Continued on page* 48)

NEWS of the INDUSTRY

New Theme Featured By Kitchen Bureau

"We've cooked up something new," says the Modern Kitchen Bureau, in announcing its 1940 fall electric range promotion. The underlying theme continues to be that of the spring campaign—"electric cooking is fast as fire without the flame, clean and cheap, like electric light"—but the vehicle for getting this theme across to the public is distinctively different.

"Alice in Electric Wonderland" is the promotional banner under which the big sales guns are wheeled into action. The big feature is a "Magic Mirror" window display, carrying out the "Through the Looking Glass—An Adventure of Alice in Electric Wonderland" idea. When the light in the display is off, the glass is a mirror inviting passersby to stop and primp. When the light flashes on, the prospect looks *through* the mirror and sees a colorful picture of Alice exclaiming over the marvels of modern electric cookery.

The Magic Mirror central display unit is supported by a series of four counter cards reproduced in full color from actual color photographs and a series of five range cards to be set in and on the electric range itself, calling the prospect's attention to five major sales points.

Collateral material includes direct mail folders, a newspaper mat service and radio spot announcements, all built about the "Alice" theme.

An important addition to this fall's activities is a plan whereby electric leagues, local bureaus and utilities may stage a pretentious show that is, in reality, a brand new kind of cooking school. A special port-folio has been built by the Modern Kitchen Bureau containing complete details, plans for the production of this elaborate promotion. It marks a new high in the promotion of electric ranges, providing a way in which dealers may all share in a project of such magnitude that no dealer alone could hope to put it on.

National advertising continues through the fall months in *McCalls Magazine* and *Better Homes and Gardens.*

Virginia Utilities Announce New Projects

More than $6,000,000 will be expended by the Virginia Public Service Company and the Virginia Electric and Power Company on generating stations and transmission lines serving the strategic Hampton Roads area, with construction to begin immediately, it was announced in August by the State Corporation Commission, Richmond, Virginia.

M. J. O'Connell, president of the Virginia Public Service Company, stated that the $6,000,000 program will involve the construction of a transmission line from Richmond to Newport News to supplement and add to the Company's electric facilities at Hampton. The major expenditure, he stated, will be made by Virginia Electric and Power Company which will not only share in the construction of the Richmond-Newport News line but will erect a 40,000 kilowatt addition to the Reeves Avenue power plant in Norfolk at a cost of more than $4,000,000.

These construction projects, according to Mr. O'Connell, are in line with the National Defense program and are calculated to provide unlimited sources of power for the very important Hampton Roads area. He pointed out that in the case of his company, serving the Peninsula, where is located the Newport News Shipbuilding and Dry Dock Company, Langley Field, N.A.C.A., and Fortress Monroe, electric power demands have been considerably increased through the nation's preparedness activities.

The line will directly connect with the generating and transmission system of the Virginia Electric and Power Company. Since this company's transmission lines are tied-in with neighboring systems, power could be secured from the Appalachian Electric and Power Company, operating in Virginia and West Virginia, the Carolina Power and Light Company and the Duke Power Company, operating in North Carolina. This would be in addition to the power generated at the Virginia Public Service Company's steam and hydro generating stations located in Virginia and West Virginia.

The new line will begin at the Manchester substation in Richmond, follow east to the James River at Messer Road, then on to Newport News. It will be a 110,000 volt line and provide a potential capacity of 35,000 kw to the Hampton Roads area.

In commenting on the new projects, Jack G. Holtzclaw, president of Vepco, said:

"Construction activities on the Reeves Avenue plant in Norfolk will begin immediately and when completed will increase the capacity of the Norfolk steam power plant by over 50%. This addition follows closely behind a similar addition made to the 12th Street Power Station in Richmond which was just put into operation early this year. The need for a large increase

Modern Kitchen Bureau's fall range display material.

in power supply in this whole Tidewater area is foreseen as a direct result of tremendous construction activities in connection with the national defense program."

R. J. Throckmorton, vice president of Vepco in charge of the Norfolk district, stated that the new power station addition in Norfolk is scheduled for completion in the fall of 1941, which will be in ample time for expected increase in power requirements in connection with the shipbuilding activities and other phases of the national defense program and that construction work on the transmission line which will tie in the two electric power systems will require a period of perhaps six months, and is scheduled for completion early in 1941.

The Lower Colorado River Authority, in Texas, is cooperating with dealers in the various towns of its territory and staging home appliance shows. This photograph shows one corner of a display that was staged July 3-6 at Kerrville, Texas, in the showroom of a local auto dealer. Every dealer in Kerrville cooperated in this show and presented a complete line of electrical appliances. More than 4000 people in this town of 5500 attended the show.

Exchange Engineers Meet in Charleston

An outstanding program has been prepared by Chairman Lewis Payne, for the Engineering & Operation Section, Southeastern Electric Exchange, meeting to be held in Charleston, S. C., at the Fort Sumter Hotel on September 19 and 20.

The two-day program will include timely subjects of interest to men supervising work in production, transmission, distribution, and utilization departments of member companies.

An added attraction will be an informal gathering of production men following the presentation of the subject on modernization of existing power plant facilities and maintenance, by J. A. Reich, supervisor of stations and substations, Virginia Electric and Power Company. This separate meeting for production men will give them an opportunity to discuss further what steam and hydro engineers are doing specifically in their plants to enhance reliability of existing facilities and to extend capacity to the full limit of availability.

In addition to opening remarks by Chairman Payne and an address of welcome by E. L. Godshalk, president, South Carolina Power Company, the first morning session will also include a discussion on transmission lines by J. F. Pennington, superintendent wholesale operations, Georgia Power Company. A. W. Higgins, president of the Exchange, will address the group at a luncheon meeting Thursday.

The Thursday afternoon session will include a discussion on high speed carrier current relay developments by R. M. Smith, engineering department, Westinghouse Electric & Mfg. Company. Improved performance of distribution regulators by means of over compensation will be the subject of a paper by P. J. Carlin, superintendent of distribution, Florida Power & Light Company. The Thursday afternoon session will be concluded with a talk by R. M. Grogan, Alabama Power Company, on methods suggested in determining transformer capacities of given loads.

The first speaker on the Friday morning program will be D. K. Blake, distribution systems engineer, General Electric Company, who will talk on modern trends in distribution. Also scheduled for the Friday morning meeting is a talk by Frank E. Johnson, operating distribution engineer, New Orleans Public Service, Inc., on maintaining service during a 60-mile tropical wind storm. He will be followed by James B. Polhill, Jr., project superintendent, Jefferson County Electric Membership Corporation, who will discuss the operation of REA systems.

The Friday afternoon session will be opened with a discussion on customer metering and periodical testing, by T. A. Busby, assistant to president, South Carolina Power Company. The remainder of this session will be devoted to a round table discussion of current problems. An opportunity for a general discussion will be provided after each address.

Small Diameter Wire Now Carries "UL" Label

Underwriters Laboratories' Labeled Types RHT, RPT, RU, and SN small diameter building wires are now available, according to a recent announcement by Underwriters' Laboratories, Inc., Chicago. At the time of this announcement, label service had been extended to 12 manufacturers making Type RHT, 17 making Type RPT, four making Type RU, and 13 manufacturing Type SN.

The availability of these wires bearing Underwriters' Laboratories' labels is expected to assist materially in giving relief to owners and occupants of buildings which have for years been "electrically starved" and for which, until recently, there was no remedy other than the expensive and unsightly method of chipping and channeling and replacing existing conduit with conduit of larger size to provide the desired capacity for wiring to meet the need of "stepped up" lighting and other modern electrical demands.

Recent surveys show that 75 per cent or more of the apartment houses, hotels, schools, office buildings, and similar structures erected ten years and more ago are lacking in wiring capacity to meet the demands of tenants. This situation has been one of grave concern for the owners and managers of buildings, for the public, and for the electrical industry as well. That the situation was also recognized by the members of the Electrical Committee is evidenced by the fact that the forthcoming edition of the National Electrical Code (1940), which is expected to be released early in September, permits, under specified conditions, the use of the new small diameter building wires mentioned above.

MORE FREE TIME FOR MOTHERS
Leisure FOR Living
THAT'S MY PARTY-PLATFORM!
My part in this program is to win the hearts of your neighbors and turn their attention to YOUR STORE.

WESTINGHOUSE FALL ACTIVITY

OCUSED ON YOUR STORE

1. **NATIONAL ADVERTISING**
   13 color pages—to create acceptance for your Leisure Lines.
2. **MUSICAL AMERICANA**
   Plugging for you every Tuesday.
3. **DRAMATIC DISPLAYS**
   To put your store in the Leisure Line limelight.
4. **4-PAGE NEWSPAPER FLYER**
   Imprinted with your name.
5. **KEY CITY ADVERTISING**
   To add speed-power to your local campaign.
6. **LOCAL ADVERTISING**
   Points right to your store.

PLUGS *Leisure for Living*

with a Dramatic, Volume-Building Program!

Never has there been a more dramatic theme! It emphasizes the emancipation women have sought for ages. It directs attention to the easier, more economical ways of living that electricity has made possible.

Thirteen color pages in four big national weeklies create acceptance for this *Leisure-Living* Theme. But that's only half the story. *Blondie*, of comic-strip fame, will lead the parade of prospects to your store. And here's how.

BLONDIE GOES TO LEISURELAND

Westinghouse has made available this give-away, traffic-building game. It's built around a favorite, comic-strip family; Blondie, Dagwood, Baby Dumpling, and Daisy! A brand-new game! Hilarious fun for old or young. *A game that will draw prospects right into your store.*

GET BEHIND THIS PROGRAM—*It starts September 24.* Ask your Westinghouse man. He has all the details. Or write direct to department 204.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
MERCHANDISING DIVISION MANSFIELD, OHIO

Tune in "Musical Americana," N. B. C. Network, Coast-to-Coast, every Tuesday evening

Westinghouse THE *Leisure Line* OF *ELECTRIC* HOME APPLIANCES

Although it has been known for some time that the 1940 Code would allow Type RHT for new work and for rewiring, and RPT, RU, and SN for rewiring existing raceways, and these materials have been available, nevertheless some difficulty has arisen in the field and many jobs were held up pending the Laboratories' approval and labeling of the new materials. The availability of labeled small diameter conductors should release a flood of work heretofore frozen.

REA Survey Reveals Appliance Saturations

Nearly nine out of ten farm homes on REA-financed electric lines have radios, more than eight in ten have electric irons, more than half have electric washing machines, and nearly a third have electric refrigerators, according to REA's third annual utilization survey, just made public by Administrator Harry Slattery.

The survey, which shows the extent of use of various electrical appliances on newly electrified farms, is based on questionnaires returned by 43,000 families served by 82 REA-financed systems in 27 states. While the systems have been in operation for periods ranging from six months to a little over four years, Mr. Slattery said, the average length of service for consumers reporting is 13.6 months.

The survey reveals the following percentages of use for various appliances:

Radios (non-battery)	87.5%
Electric irons	84.1%
Washing machines	55.3%
Refrigerators	31.6%
Toasters	29.4%
Vacuum cleaners	20.7%
Hot plate	14.8%
Electric water pump	15.3%
Motor (1 hp or less)	14.5%
Poultry lighting	10.5%
Bathtub or shower	8.5%
Coffee maker	7.9%
Cream separator	7.5%
Water closet	6.2%
Septic tank	5.9%
Chick brooder	4.2%
Range	4.2%
Electric fence	2.6%
Electric roaster	2.1%
Milking machine	2.1%
Large motor	1.6%
Electric water heater	1.3%
Other household app.	14.3%
Other farm app.	2.7%

Commenting on the survey, Mr. Slattery pointed out that these percentages are somewhat lower than those given in last year's survey, which reported on a group of consumers receiving service for an average of 10.5 months. This, he said, is due to the fact that the 1939 survey dealt with systems located chiefly in northern areas, particularly in such states as Minnesota, Wisconsin and Michigan where farms are larger and the use of electricity for dairying, water pumping, and other farm operations is more fully developed. Mr. Slattery explained that the new survey is corrected for distribution by states, and may be taken as a reasonably accurate picture of the REA-financed systems throughout the nation.

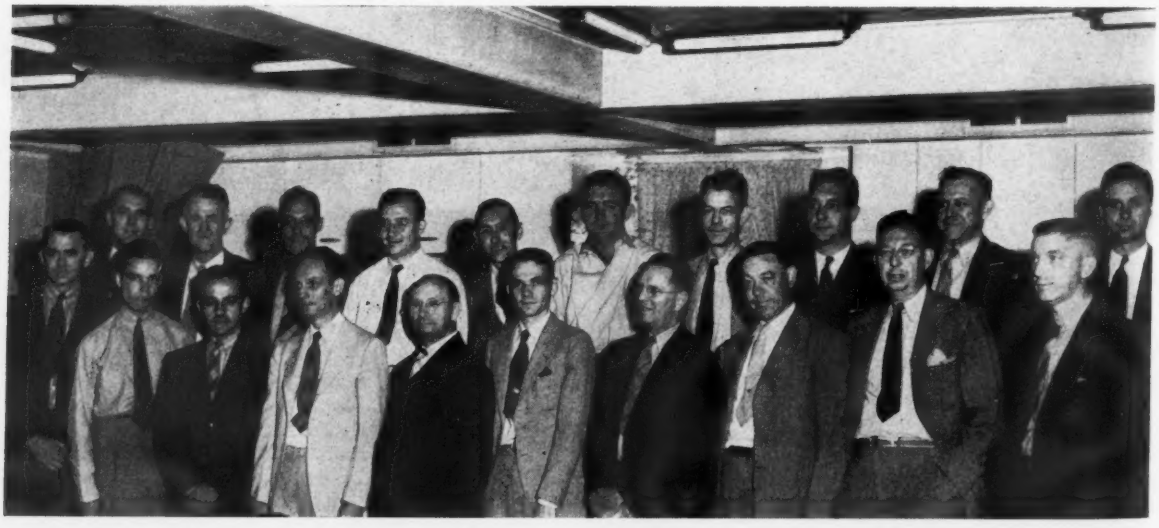
The survey reveals that major household appliance purchases are, for the most part, made during the first year after electrification. Use of farm equipment increases more slowly, as was expected, since considerable education is necessary to familiarize farmers with the ways of using electricity in farming and with the equipment available.

Georgia Campaign Boosts Range Sales

Prizes and bonus money for dealers' salesmen and a cooperative advertising plan were outstanding features of an electric range campaign sponsored recently by the Georgia Power Company and major appliance distributors, under the direction of H. A. Smeeton, dealer coordinator, Georgia Power Co.

Open to all dealers of electric ranges in the Atlanta area, the campaign resulted in the sale of approximately 200 ranges in a 60-day period by 18 dealers.

Each participating firm was given a quota of ranges to sell and each salesman was given his share of the firm's quota, the quotas being based on previous performance. Three grand prizes, $35, $25, and



Thanks to the efforts of these men, many a kitchen in Knoxville and vicinity has been made almost labor-free. They are members of the Knoxville Major Appliance Bureau which has a Code of Ethics that eliminates cut-throat competition and which promotes cooperative campaigns by members.

Front row, left to right: Frank Oates, S. H. George & Sons; Robert Goodlin, Chandler & Co.; Charles Thombras, City Electric Department; T. W. Justice, Sterchi Bros.; M. C. Maxwell, Lester Maxwell Co.; John Homer Mullins, City Electric Department; R. A. Jarnagin, S. H. George & Sons; E. F. Aurin, City Electric Co.; Dave Baker, Woodruff's; Fred Human, Lester Maxwell Co.

Back row: Herbert Johnson, Woodruff's; Greg Benson, News-Sentinel; Paul Davis, Fowler Bros.; Clyde Carpenter, Jr., City Electric Department; Howard Miller, Knox Dry Goods Co.; Zeno Brown, Electric Home Servants Co.; John Anderson, Sears, Roebuck Co.; Lawrence Wood, City Electric Department; Jess Winegar, Woodruff's; Harry Lee, Maytag Appliance Co.

ARVIN

ELECTRIC FAN-FORCED

Circulating Heaters

These Arvin Profit Makers are selling faster every year. Sales jumped 65% last year. And this year—they'll sell faster than ever with an even more aggressive consumer advertising campaign in these leading national magazines.

● Chilly weather makes hot prospects—so profit from the early demand by ordering from your Arvin jobber now. Ask him for the free sales-building window-counter card and consumer folders.

Three compact models, beautifully designed and finished. They circulate as they heat. Plug into any AC wall outlet. Safe with children. Efficient and economical.

Approved by Underwriters' Laboratories and Good Housekeeping Institute

NOBLITT-SPARKS INDUSTRIES, Inc., COLUMBUS, INDIANA

Just What Your Customers Need for:

Bathrooms • Nurseries • Dens • Guest-Rooms • Game-Rooms • Sun-Rooms • Trailers and Camp Cottages • Invalids' Rooms in Homes or Hospitals • Small Offices and Ticket Booths • Hair and Clothes Drying • Bath Houses • Photographers' Drying Rooms.

Selling Points for You to Use:

Circulates heat by using fan-distributing principle . . . Warms air completely by drawing cold air from floor, heating it and fan-forcing it into the room . . . Safe with children because heating element and fan are enclosed . . . Won't burn rug if accidentally upset . . . Doesn't interfere with radio.

Good Housekeeping Institute Approved

DELUXE MODEL 201
Tan and Brown Morocco Finish. Chromium Grille. Toe Switch and Glow Light. Size 11¾" high, 10⅝" by 6⅝" at base . . . . . **$8.95 LIST**

STANDARD MODEL 101
Two-tone Green Enamel Finish Chrome Grille. Carrying handle recessed in back of case. Size 10" high, 9¾" by 6⅛" at base . . . . . **$6.95 LIST**

DELUXE MODEL 201A
Ivory and Maroon Enamel Finish. Chromium Grille. Toe Switch and Glow Light. Size 11¾" high, 10⅝" by 6⅝" at base . . . . . **$9.95 LIST**

List Prices 5% Higher Denver and West—Also in Extreme South.

Star salesmen of Atlanta appliance dealers enjoy Georgia Power's "Victory" banquet.

$15, were awarded on a percentage of quota basis with each salesman in the contest competing against all other salesmen. In addition, a bonus of $2 per range sold was paid to every salesman whose firm made its quota. Finally, an invitation was given to the leading salesman of each firm making its quota to a "Victory Celebration" banquet. Winners of the first, second and third prizes, awarded at the banquet were H. T. Lyon, Major Appliance Company; H. S. Herman, Rich's; and L. M. Taylor, Sears-Roebuck Company, all of Atlanta.

Coincident with the range campaign, the Georgia Power Company offered to assist dealers in advertising their ranges by paying approximately one-third of the cost of the dealers' advertising of ranges. This arrangement resulted in a considerable increase in range advertising during the period of the campaign.

Another novel sales campaign, to be sponsored jointly by the Georgia Power Company and the electric appliance distributors, has just been announced for October and November. Open to all cooperating dealers and their salesmen in the area served by Georgia Power Company, the contest will include cash prizes of $465 for the winners.

Outstanding feature of this campaign will be a sales presentation contest in which each salesman will have the opportunity of giving a sales talk to meet a prescribed situation, the talk being recorded on a phonograph record. The sales talks will all conform to the same situation and salesmen may refer only to notes when the record is being made. After all the recordings have been made, a committee of judges will hear the records and will decide upon prize winners.

New Commercial Chief For Dallas Power & Light

Walter G. Moore, widely known electric utility executive, was elected a director and vice president of the Dallas Power & Light Company on August 13, George L. MacGregor, vice president and general manager of the company, announced. The new official will direct the commercial phases of the company's operations.

Mr. Moore recently joined the executive department of the Dallas company after resigning as vice president of the Texas Power & Light Company, in charge of commercial and industrial sales.

A native of Paris, Texas, and an electrical engineering graduate of Texas A. & M. College, Mr. Moore took an apprentice course with the Westinghouse Electric & Manufacturing Company after leaving college and during the next few years engaged in sales work for electrical supply and contracting concerns. Then, in 1913, he became manager for the Texas Power & Light Company at Paris.

Walter G. Moore

In 1916, Mr. Moore entered other business, but in 1925 he again became manager for the T. P. & L. Co. at Paris. In 1927 he moved to Dallas as assistant commercial manager for the T. P. & L. Co., and the following year he became commercial manager of that company. During the latter part of 1937 he was made a director and vice president of the T. P. & L. Co.

Mr. Moore was chairman of the Commercial Section, Southwest Division, of the old National Electric Light Association for two years; was chairman of the Air Conditioning Committee of the Sales Section, Edison Electric Institute, for two years, and is a past president of the Petroleum Electric Power Association.

Shreveport Manager Retires— Succeeded by N. P. Heath

Appointment of N. P. Heath as general manager of the Shreveport and Caddo Divisions of Southwestern Gas and Electric Co. was announced recently by A. Lieberman, president. Mr. Heath, who has been power superintendent, succeeds M. T. Walker, who retired July 1 after more than thirty-three years of service with southern utility organizations and several years service previous to that with utility companies in other parts of the country.

At the same time, Mr. Lieberman announced that Mr. Heath had been elected a vice president of the company.

Mr. Heath was born in Champaign, Illinois, and in 1904 moved with his parents to Evanston, where he attended the public schools and later entered the University of Illinois, where he was graduated in

lectric Cooking is LOW-COST cooking

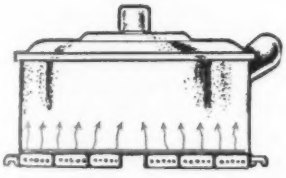
.. and the new CHROMALOX Super-Speed unit proves it.

TRY TOUCHING A HOT FLAT-IRON,

if you want evidence that CONTACT transmits heat the fastest way. Then consider that Chromalox range units transmit heat entirely by CONTACT, and that their flat top gives far more CONTACT COOKING SURFACE than any other metal-encased unit — from 100 to 250 percent more!

Add to this the further savings of "Two-Units-in-One" — the exclusive Chromalox feature which provides, in every unit, selective **rings of heat of varying size** to fit large or small utensils.

Those are the reasons why **Chromalox units lead in low-cost cooking**, as demonstrated three times a day in the kitchens of America from Maine to California! Those are the reasons why you can **sell low-cost electric cooking** in ranges equipped with Chromalox units. **Make ECONOMY your key sales point —sell Chromalox-equipped ranges**, and you'll sell more ranges!

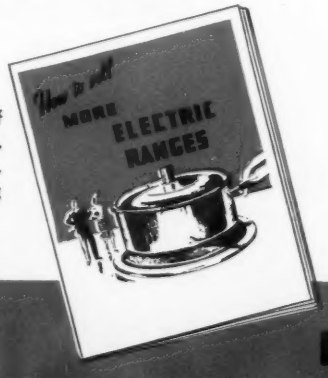


e saving is in the **CONTACT!**

Heat goes straight from the Chromalox flat top to the bottom of the cooking vessel. No "reflected" heat, no cold spots.

nd . . .

or your copy of "HOW TO SELL MORE RANGES". t's full of strong ales points.



EDWIN L. WIEGAND COMPANY

7600 Thomas Boulevard — **PITTSBURGH, PA.**

Write us or our nearest representative

ATLANTA, GA.
gers, 1000 Peachtree Street

OKLAHOMA CITY, OKLA.
Paul Berry, 3128 N. W. 26th Street

DALLAS, TEXAS
Elgin B. Robertson, 1215 N. Zangs Blvd.

RALEIGH, N. C.
W. R. Phillips

RUBBER COVERED POWER CABLES • BUILDING WIRE

CRESCENT

GENUINE

A.B.C.

Armored Bushed Cable

1. CONDUCTORS—Clean stripping insulation and flame retarding covering, printed as shown.
2. BUSHING—easy to insert as paper unwraps from *under both ends* of armor to make room for the bushing.
3. STEEL ARMOR—low resistance, electro-galvanized for maximum uniformity and longest life.
4. TESTED—Thoroughly tested at several points during manufacture and receiving a final test of 2000 volts between conductors and armor.
5. *CRESCENT has unexcelled facilities for the complete manufacture of Armored Bushed Cable in all its steps. When you buy CRESCENT A.B.C. ARMORED BUSHED CABLE you buy the best. Do not be satisfied with any substitute.*

CRESCENT INSULATED WIRE & CABLE CO. INC
TRENTON, NEW JERSEY

SOUTHERN REPRESENTATIVES

ATLANTA, GA.
Edgar E. Dawes
A-4 Rhodes Bldg. Annex

NEW ORLEANS, LA.
Paul Hogan, Jr.
823 Perdido St.

CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE

VARNISHED CAMBRIC • FLEXIBLE CORDS • LEAD-ENCASED AND PARKWAY CABLES • ARMORED CABLE

CRESCENT ENDURITE SUPER-AGING INSULATION

1913, receiving a B. S. in E. E.

He began his career in the utility industry in 1914 when he was employed by Southwestern Gas and Electric Company as meter reader and trouble shooter. From 1915 to 1917 he supervised the installation of machinery and equipment that was added to the company's old power station.

Following service with the A.E.F. he returned to the United States and resumed his duties with Southwestern Gas and Electric Company. From 1919 to 1925 he served in various supervisory capacities in both the gas and electric departments of the company. From 1925 to 1927 he supervised the construction of the present Arsenal Hill generating plant. Upon completion of the plant, he was appointed superintendent of power which position he has held up to the present time.

Tampa Advertising Manager Joins Ralph H. Jones Agency

Jack Lacey, advertising manager of the Tampa Electric Company at Tampa, Fla., since 1931, has accepted a position as account executive with the Ralph H. Jones Advertising Agency of Cincinnati.

Mr. Lacey directed the advertising campaign of the Tampa company that won the 1940 George A. Hughes award and gave his company its greatest electric range sell-

Jack Lacey

ing year in history. He will continue to handle utility advertising in his new job.

The Tampa Advertising club of which Lacey is a former president, other organizations and friends in Tampa gave several farewell functions in his honor. Salesmen of the Tampa Electric Company presented a gold engraved desk set to him at a testimonial meeting.

His former position is being filled by M. T. Anthony, sales manager of the Tampa Electric Company, with the assistance of Arnold Brown, Tampa advertising man.

MANUFACTURERS' News

Presidential Campaign For Hotpoint Dealers

At a series of Hotpoint Presidential Campaign conventions, now being held throughout the country, Hotpoint retailers will meet with distributors and Hotpoint range specialists, to map their local Hotpoint Presidential Campaigns, which are expected to bring about a veritable landslide of sales for Hotpoint's fall candidate—the new President range.

According to Ward Schafer, manager, Hotpoint Range division, four important factors combine to make this one of the most complete electric range programs ever sponsored by Hotpoint:

1. Timeliness. Sharing the spotlight with America's great national event, the Hotpoint Presidential Campaign is designed to turn the eyes and interest of every woman toward her local Hotpoint retailer.

2. An Entirely New Product. The campaign is built around Hotpoint's "winning candidate"—the new President electric range. This range is brand new in every detail, is priced at $129.95, at the factory, with freight and installation extra, and backed by a special "President" finance plan.

3. Endorsed by George A. Hughes. The President range, introduced by Hotpoint just for this campaign, is sponsored personally by George A. Hughes, The Hotpoint Company's chief executive, who is known everywhere as the "father of the electric range."

4. A giant sales promotion package, containing everything needed to launch any Hotpoint retailer on his own active Presidential Campaign.

First announcement of the Presidential Campaign was made to retailers through a colorful trade broadside, which can be converted into a wall hanger to help promote the Hotpoint President range.

The Hotpoint Company is putting every ounce of its experience and ingenuity behind this retailer program, backing it with national and key city advertising featuring the "President" range. In addition, the company is announcing a special plan for showings of "Blame It On Love," in the 16 mm size, to women's clubs throughout the country.

Fall Selling Campaign For Westinghouse Dealers

Plans for an aggressive fall selling campaign, backed by the largest year-end advertising program in the history of the Westinghouse Merchandising Division, have been given to the company's distributors in a special convention in Mansfield. New product information and full details on the advertising and promotional phases of the fall selling program have been given to Westinghouse dealers.

Frank R. Kohnstamm, sales manager of the Westinghouse Merchandising Division, has stated that the outlook for fall appliance business is very bright because of continued good business. This is particularly true of the small appliance and laundry equipment business. To enable distributors and dealers to make the most of the opportunities presented, Westinghouse is launching a complete sales plan built around new products, a plan to build dealer floor traffic and increased advertising.

The fall selling program will be supported by a schedule of 13 full-page advertisements in four leading weekly magazines, and in expanded newspaper advertising schedules, both on a company-paid key city program and on a dealer-company co-operative basis.

Feature of the intensified promotional effort will be nation-wide distribution of a new game that will be obtainable free at Westinghouse dealers. Announcements offering the game for 10 cents if requested by mail, or without charge if obtained by an adult from a Westinghouse dealer, will be carried weekly on "Musical Americana," the Westinghouse radio program, and newspaper advertising also will carry mention of the game.

J. A. Sullivan, Westinghouse appliance sales manager, and the new small appliance display stand.

Several new lines of products were shown to the distributors at the conventions, by means of demonstrations and skits. These included: a new vacuum cleaner, known as the "Captain," priced at $39.95, and featuring specially designed "Easy-Empty" tabs which make the usually-unpleasant task of emptying dirt from a vacuum cleaner a clean, simple operation; sixteen new appliance models, including a fully-automatic "pop-up" toaster which is thermostatically controlled, priced at $12.95; a full new line of washers, featuring new streamlined design and enlargement of tub capacity with prices ranging from $49.95 to $99.95.

The fall range promotion will be built around a new range model to be known as "The Harvester." The plan includes advertising, demon-

stration plans, and other dealer helps. The new model, priced at $129.75, has the five-speed Corox surface unit, full-sized True-Temp oven, an ultramodern triple-louvered platform light, and white handles and switches.

The fall refrigerator selling campaign will be built around "Super-Market Refrigeration." This is described as the kind of refrigeration available to a housewife with a Westinghouse refrigerator, with its five zones of cold.

Small Appliances Emphasized by G-E Tour

In the most extensive effort to date put forth in behalf of its small appliance lines, the General Electric appliance and merchandise department launched four travelling units from Bridgeport headquarters in mid-July for the purpose of carrying to distributor-salesmen groups in 43 cities a dramatic story on new small appliances. This marks the first occasion on which heating devices have been given full-dress promotitonal attention in the manner usually reserved for such major lines as refrigerators or ranges.

Marked increases in electrical appliance business, plus outstanding product developments for the coming year prompted the vigorous program in behalf of G-E heating devices, according to A. C. Sanger. Taking the meetings direct to the salesmen in the field is expected to emphasize the major character of the small appliance business, with its average of 5000 profitable sales during each working day and annual retail volume of approximately 75 million dollars.

Headline attraction of the presentation was the newly-developed General Electric automatic glass coffee maker which has been designed so that it is easier to handle, will make one or two cups as well as a full load, functions automatically without attention, and maintains the brew at a high temperature until it is ready for use.

Other new items in the line include a new automatic electric toaster, with provisions for keeping warm toast that is made; an electric roaster that incorporates the "Tel-a-cook" light indications of degree of heat, similar to the indication system of a full-size G-E range; a new triple-beater mixer of extraordinary power and with reversible features and bowl illumination; and new lightweight automatic iron, which uses light to signal the point at which ironing should begin; and newly designed hot plates, percolators, and sunlamps.

New Campaign to Launch Arvin Electric Heater

An aggressive merchandising and advertising campaign to launch the new 1941 Arvin Electric Fan-Forced Circulating Heaters has been announced by G. W. Thompson, vice president, Noblitt Sparks Industries, Inc., Columbus, Indiana. The campaign features space in the following consumer publications: The American Magazine, Collier's, Good Housekeeping, Better Homes & Gardens, Parents' and The American Home. It is also supplemented by other sales help including hand-out folders and a three color counter-window display.

According to Mr. Thompson, last year sales on this popular home heater increased 65% over the previous year. They are expected to sell even faster this year as a result of the widespread campaign, dealer interest and consumer acceptance of the product which has been approved by the Underwriters' Laboratories and Good Housekeeping Institute.

The heaters are efficiently constructed and are safe with children. They circulate warm air completely by drawing the cold air from floor, heating it, and fan-forcing it into the room. These heaters convert 98% of electric current into circulating heat. Portable type that can be used in any room with a 110 a-c wall outlet.

The new line of electric home heaters includes a standard model and two deluxe models which retail from $6.95 to $9.95. The cabinets are of heavy guage metal on rubber feet. The standard model 101 is finished in two tone green enamel. The deluxe models are available in ivory and maroon enamel, and in tan and brown morocco. Both these heaters have chrome grilles.

Arvin Heater counter display.

New Tank-Type Cleaners Announced by Universal

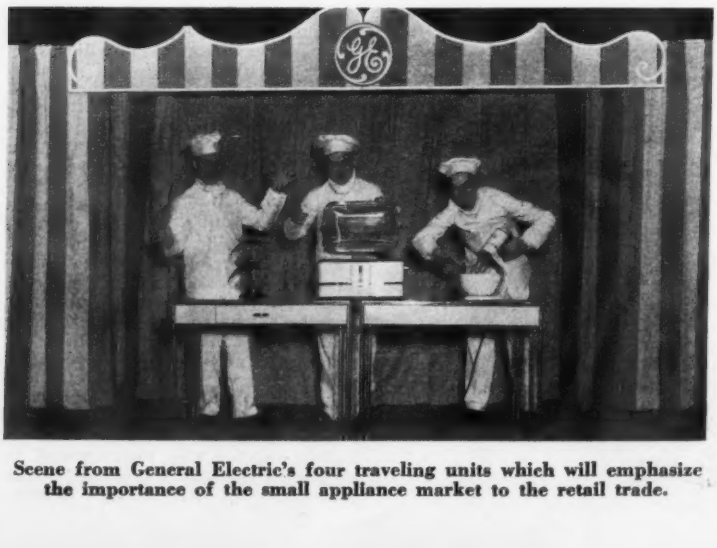
Recent figures show that the tank-type cleaner is winning public preference at an ever-increasing pace, according to Lee Moss, vacuum cleaner sales manager for Landers, Frary & Clark. Said Mr. Moss, "Month after month a greater percentage of the nation's total cleaner business consists of this type. This becomes increasingly important when one considers that total floor model sales in the U. S. are reported at 639,579 for the first five months of 1940 as against 480,220 for the same period last year."

Recognizing this trend, Landers, Frary & Clark have added two new tank-type models, the E-65 and E-50.

In its new E-65 tank-type cleaner, Universal is contributing an important advancement in this type of cleaner. This is the "Tattle-tale" warning light located in the handle of the cleaner which flashes red when the dust bag needs emptying. This feature is an important aid to efficient operation and is an especially strong sales feature. Other features, added this year, include increased suction; a foot-operated switch; floor polisher attachment; swivel floor brush; larger shell, finished in delft-blue; improved sled; storage kit for all attachments and an easier, yet air-tight hose connection.

The Economy Model, E-50, also to be featured by Universal, is primarily intended as a price leader. It will be ideal for families who do not require quite the full cleaning service provided by the E-65.

Landers, Frary & Clark plans to give these two new Universal cleaners extensive promotional backing. A new cleaner broadside is being mailed to every dealer in the United States. Newspaper and magazine publicity and advertising in various markets of the country are planned.



Scene from General Electric's four traveling units which will emphasize the importance of the small appliance market to the retail trade.

News About People—

George T. Stevens has joined the Eureka Vacuum Cleaner Company, Detroit, Mich., in the capacity of vice president in charge of sales. To accept his new position, Mr. Stevens resigned as manager of the refrigerator division of the Crosley Corporation. His experience in the household appliance field covers a broad range. At one time he operated a wholesale and retail business in Pennsylvania and this was followed by connections with Allied Department Stores and Montgomery Ward & Company as merchandising manager.

Geo. T. Stevens

* * *

James H. Jewell has been appointed manager of agency sales by the Westinghouse Electric & Manufacturing Company. This department is responsible for the company's apparatus products sold through distributors. Mr. Jewell has been associated with Westinghouse since 1920. He was made manager of the construction industry section in 1930. In 1938 he was made manager of the public works and communications sections and in 1939, assistant manager of the agency sales department.

James H. Jewell

* * *

Merritt L. (Tiny) Tice has recently become associated with the manufacturers' agency firm of Edgar E. Dawes & Co., Atlanta, Ga., according to announcement of **Edgar E. Dawes.** Mr. Tice is well known to the electrical industry of the Southeast because of his former connections with such prominent manufacturers as Benjamin Electric Mfg. Co., General Cable Corp., and National Electrical Products Corp.

M. L. (Tiny) Tice

Edgar E. Dawes & Co. has long been identified as southern sales agents for such well-known manufacturers as Crescent Insulated Wire & Cable Co., Trenton, N. J.; Spang-Chalfant, Inc., Pittsburgh, Pa., (manufacturers of Central conduit, etc.); and Steel City Electric Co., Pittsburgh, Pa. The territory covered by this organization includes North Carolina, South Carolina, Georgia, Florida, Alabama and the eastern half of Tennessee. Office and warehouse is maintained in the Rhodes Bldg. Annex, Atlanta, Ga., from which point the southern electrical trade will continue to be serviced.

Edgar E. Dawes

* * *

Ed B. Hook has been appointed sales engineer for Kennecott Wire & Cable Products in the Southeast, according to announcement by Kennecott Wire & Cable Corp., Providence, R. I. Mr. Hook will make his headquarters in the Bona Allen Building, Atlanta, Ga. His territory will include South Carolina, Georgia, Florida, and Alabama.

Ed. B. Hook

* * *

Appointment of **George H. Meilinger** as sales development manager of household refrigeration was announced by **J. T. Newcomb,** manager of the newly-created household refrigeration and laundry equipment department of the Westinghouse Merchandising Division, Mansfield, Ohio. Mr. Meilinger, former refrigeration supervisor in Chicago, will be responsible for development

The Youngstown Pressed Steel Kitchen Institute is proving a very valuable and effective sales help in training both distributors' and dealers' salesmen to plan really efficient kitchens. The planning school is demonstrating that kitchens are easy to sell when they are properly planned. And the ABC of planning is "Arrangement for Beauty and Convenience."

of household refrigeration sales. He succeeds **H. M. Butzloff,** resigned.

L. L. Shawber, manager of the laundry equipment department until it was combined recently with the household refrigeration department, will become laundry equipment product supervisor in the new department. **S. G. Fisher,** formerly in the dishwasher sales department, will become sales development manager on laundry equipment.

* * *

W. H. Milton, Jr., who has been sales manager for the General Electric plastics department at Pittsfield, Mass., for the past two years, has been appointed assistant manager, responsible to **G. H. Shill,** manager, for all phases of the department's activities. A native of Roanoke, Va., and graduate of Virginia Military Institute, Mr. Milton has been associated with G-E since 1920.

* * *

Charles J. Coward, newly appointed advertising manager of the Nash-Kelvinator Corporation, has been appointed chairman of the Plan Committee of the Modern Kitchen Bureau, it is announced by **W. H. Sammis,** chairman of the Bureau. Mr. Coward succeeds **J. Nelson Stewart,** who has resigned as plan committee chairman. Mr. Coward was formerly associated with the Ralph H. Jones Company, at Cincinnati, and has been active in the work of The Modern Kitchen Bureau for the past three years.

New Electrical Products

Premier Floor Cleaner

With the introduction of the new Premier Model 41 Floor Cleaner, Electric Vacuum Cleaner Co., Inc., has placed on the market a cleaner that is distinctly different. The striking dark green crinkle-finish of this cleaner is more than a mere novelty—it is durable, long wearing, and designed to stay new-looking for many years. The new Model 41

will sell at retail for $44.50 and at this price should prove to be a highly popular addition to the line. The specially-woven sateen dust bag is in a harmonizing shade of green and has a trap in the throat to prevent dirt spilling on the floor when the bag is removed for emptying. This cleaner has a high-power ballbearing motor and an adjustable motor-driven brush, as well as a dirt-finding Search-lite. A soft molded-rubber bumper around the nozzle prevents marring of woodwork.

Low-Priced Range Model

Announcement of the ER-9, a new low-priced model which has been added to the 1940 line of Kelvinator electric ranges and which carries a suggested price of $99.50, is made by Frank R. Pierce, Kelvinator's general sales manager. The new model is of one-piece welded steel construction, and its features include the new Kelvinator oversize, two-unit oven; five-speed Kelvinator

Chromalox surface units; a full six-quart Scotch kettle; five-speed bi-rotary silver contact switches; and a combination oven and thermostat with automatic pre-heat cutout and "Broil" and "Bake" pilot lights. Also featured in the new model is a porcelain enamel drip tray under the units; a large, easy sliding utility drawer; rust proof utility drawer guides; drawer; appliance outlets mounted on the wall guard; and a black toe-room base.

Silex Steam-Electric Iron

A new Automatic Electric Steam Iron just announced by The Silex Company, Hartford, Conn., was displayed for the first time at the recent New York Housewares Show. One of the many exclusive features of this new iron is a perfected switch for on or off steam control. The iron may be used with steam at an extremely wide range of temperatures—or it may be used as a dry iron with rougher materials. A built-in safety valve assures the housewife that she will be able to use this splendid new iron with absolute safety.

Clearly visible on the heel of the iron is an efficient thermostatic control switch, combined with an on or off current switch. This makes it unnecessary to jerk the cord out of the wall to shut off the current—a flick of the switch and it's done! Marked on this control switch are temperature indications for most of the materials a housewife might have to iron. One of the outstanding features of this new iron is its extremely light weight—only 3¾ pounds. Combined with the new Silex No-Lift Roller Bearing Iron Stand, this iron may truly be said to have slashed the housewife's wash day work to less than half of its former figure. The iron is equipped with 1000 watt heating element.

Commercial Waffle Baker

A new Edison-Hotpoint waffle baker, aptly named the "Charm" from its attractive, modern, streamlined, functional design, is being introduced this fall with a unique new merchandising service, and at a new low price, by The Edison General Electric Appliance Co., Inc.

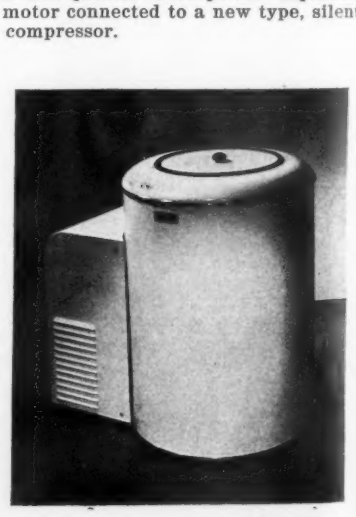
The waffle baker itself consists of two standard seven-inch molds, each with its own independent, adjustable thermostatic control and triple use "Silent Waffle Salesman" light. This light acts first as a pilot, showing when the baker is "on"; second, as an indicator showing both when the baker has reached temperature and when it is time to remove the waffle, and third, as a flashing "Waffles" sign.

The unique merchandising program which accompanies this baker includes the new book "It It's Waffles You Want"—the most complete work on waffles yet published—and an attractively lithographed waffle sign with metal pockets for changeable waffle specials and prices, a set of which accompanies each sign.

"Deep-Freeze" Locker

Introduction of a new electrical household appliance in the form of a sub-zero locker box for home use has just been announced by the Motor Products Corp., Chicago. This new appliance, designated as the "Deep Freeze," is designed to provide refrigerated storage in the home for fast frozen products.

The Deep-Freeze locker will be available in both a single unit and a double unit, having capacities of one barrel and two barrels, respectively. The unit is streamlined, consisting of an upright cylinder, with the compressor housed under a small hood at the side. The unit is powered by a one-quarter horsepower capacitor motor connected to a new type, silent compressor.



Why UNIVERSAL Electric Dealers Say:

1940—The Best Range Year Yet!

Across the country, UNIVERSAL representatives have asked Universal dealers, "What kind of range year is 1940?" They have gotten this one answer!

UNIVERSAL Electric Range Sales are up! Dollar volume has hit new peaks! Profits have stratosphered to all-time highs!

First in Sales Features and Design

Dealers everywhere credit UNIVERSAL'S year-ahead styling, speed and economy plus its many amazing features like Mult-I-Heat Control with 101 top-of-range heats for making this their banner range year.

Fall Sales-Producing Strategy Features
M. K. B. Tie-In

UNIVERSAL'S big fall sales-making magazine and newspaper promotional campaign, plus a sure-fire tie-in with Modern Kitchen Bureau's fall range drive, plus the UNIVERSAL Election Contest, plus cooperative campaigns, direct-mail pieces, sound-slide films, visualizers and radio announcements — will bring customers to the point of sale...and make sales come easier.

UNIVERSAL FRANCHISES STILL OPEN

To the electric range dealer, a UNIVERSAL franchise spells opportunity. It enables you to do business as you want to do it. You can be sure of the product you sell. You can be sure of full profit-margins. For complete details, wire or write your UNIVERSAL Distributor or LANDERS, FRARY & CLARK, New Britain, Conn., today.

UNIVERSAL
The Trade Mark Known In Every Home

Proof . . . and MORE Proof of Bigger Sales and Profits

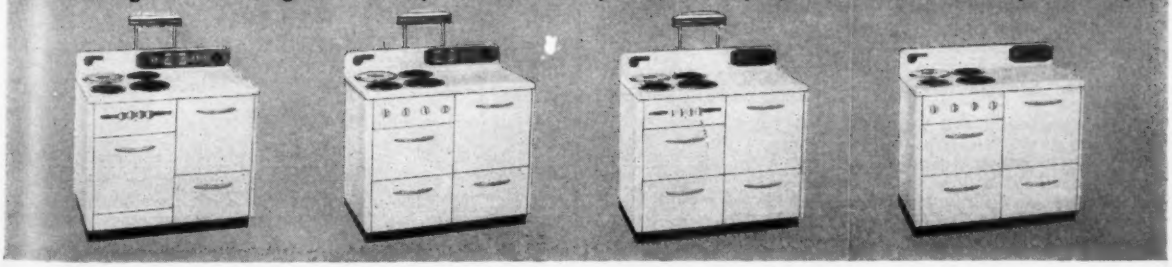
"UNIVERSAL'S new Mult-I-Heat Control is the greatest advancement since the Economy Cooker. It has increased my sales 300% over 1939."
B. E. PALMER
ED. PALMER
Asheville, N. C.

"I've found that UNIVERSAL'S new Super-Heat Unit has speeded up electric range sales and helped make 1940 my biggest year."
HARRY TAUBMAN
Wm. Taubman and Sons,
Hartford, Conn.

"One look at the modern features and beautiful appearance of the 1940 UNIVERSAL starts women saying, That's the range for me!"
ALAN A. SIGRIST
Sigrist Furniture Co.
Fort Wayne, Indiana

"We are the largest electric range dealer in the city of Buffalo and attribute this volume to the many exclusive UNIVERSAL sales features that make this range a year ahead of the competition."
DON E. STRICKLAND
Taylor-Strickland
Kenmore, N. Y.

These ranges are making sales history for '40. Model prices and step-up features make it easy to sell up



New Hotpoint Refrigerator

To provide a high quality six cubic foot refrigerator having many De-Luxe features, but at a price lower than completely DeLuxe models, the Edison General Electric Appliance Company, Chicago, has announced the new Special DeLuxe Norman model.

The exterior of the new model is finished in shining white Calgloss, with one-piece steel cabinet finished inside with white porcelain enamel.

There are four Pop-Ice trays in the stainless steel Speed Freezer, the door of which is of heavy gauge aluminum, finished in white Calgloss. The single control includes an "on-off" switch, 16-point temperature adjustment, and semi-automatic defrosting.

Colt Manual Motor Starters

One of the new line of Colt motor controls recently announced is the across-the-line type Manual Motor Starters, furnished in sizes "0" and

"1", designed for the starting, stopping and overload protection of single phase and polyphase motors up to 7½ hp. There is a wide range of applications for these new Colt Manual Starters on production tools including grinders, lathes, milling machines, looms, drill presses, profilers, planers, printing presses, rolling mills, washing machines, special machinery, etc.

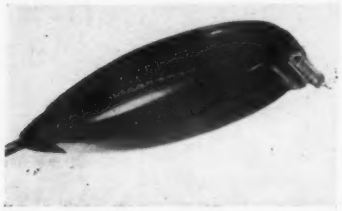
Main feature of the Manual Starters is the automatic relatching mechanism which eliminates any resetting operation as there is no intermediate or tripped position of the starter handle. The operation is "handle free" . . . an excessive overload will open the circuit even though handle is intentionally held in the "on" position.

The quick-break positive toggle mechanism is so designed that vibration or shock will not cause the contacts to open. It is mechanically impossible for the contacts to close until the "start" button has been pressed.

Knapp "Speedster" Shaver

Knapp-Monarch Co. will make a definite bid for the youth market for electric shavers with the newest of the Knapp Natural-Angle Shavers, the a-c model "Speedster," priced to retail at only $5.

The "Speedster" has the same cutting head, the same natural angle, the same exclusive features contained in the deluxe and standard Knapp Shavers. The high-speed motor



moves cutting edges so fast—7,200 cutting actions a minute—they cannot jerk, pull, or skip over whiskers. The two-in-one shearing head provides two sizes of slots, for coarse or fine beards. Because the shearing head is self-honing, it stays keen and sharp. The shaver is packed in an attractive limp leather case.

In keeping with the Knapp-Monarch method, full profit for the dealer is in the $5 list price.

Flashlight Storage Battery

A rechargeable flashlight battery similar in principle to the well known automobile storage battery is announced by the Ideal Commutator Dresser Company, Sycamore, Illinois. Although small in size to fit all popular two cell, 1¼" size D flashlight cases, it is proven through actual heavy duty service to be dependable, long lived and economical. Large users of flashlights can enjoy big savings through the use of the Ideal Battery for it can be charged time and time again. In heavy use one discharge is equal to a pair of ordinary dry cells. The rechargeable feature makes it convenient to use only while light is bright, and charge again when light gets dim.

An ingeniously arranged chamber and vent plus semi-fixation of the electrolyte makes it spill proof. The plates are over ¼" thick and connected to terminals by reinforced electrodes so that the battery is rugged parent Lucite. A small charger consisting of transformer and rectifier plates makes it easy to keep the battery always fully charged.

New 6-Watt Fluorescent Lamp

A new 6-watt Mazda fluorescent lamp only 9 inches long, for use where space is limited and high lumen output is not required, has just been announced by the Westinghouse Lamp Division, Bloomfield, N. J. Selling for $1.15, it fills a need for a small, low wattage, economical fluorescent lamp, is available in two colors—daylight and white. The new lamp is expected to find applications in illuminating business machines, curved showcases and coves, airplane and ship cabins, niches, cabinets, mirrors, bed lamps, and paintings.

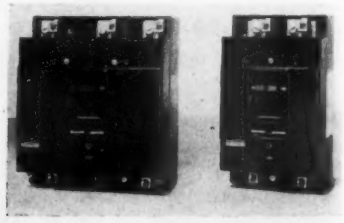
New Grounding Device

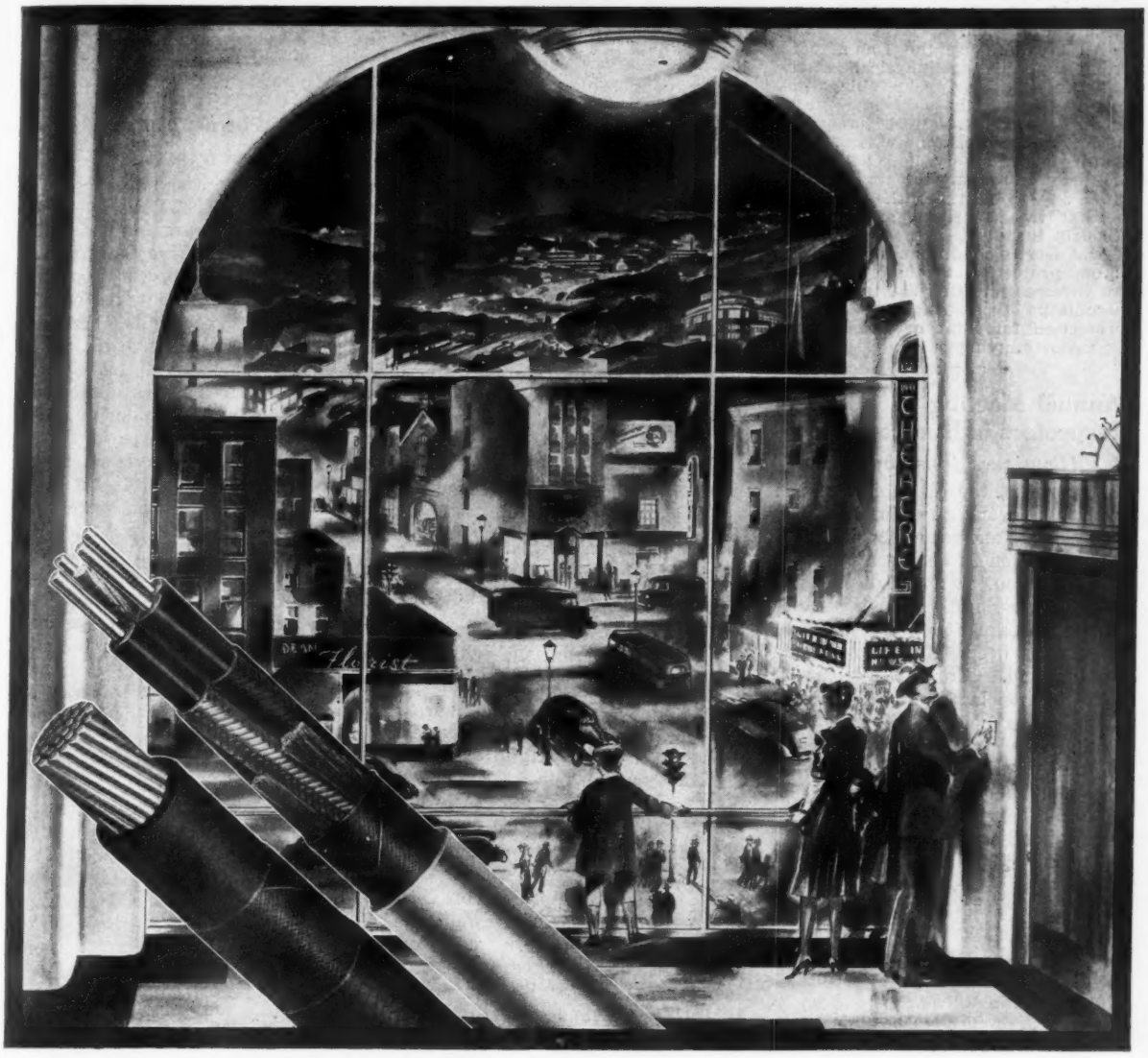
"Groundex," an efficient and economical ground that combines ground contact plate, strap and connector, all in one complete unit ready to attach to the pole, has just been announced by Mastergrip Utilities Supply Corp., St. Louis, Mo.

"Groundex" is made of pure sheet copper, insuring long service. Simply nail it to the pole before setting. The plate at the bottom of the pole, pressed against moist earth by constant compression, insures a positive ground under varying weather conditions. "Groundex" is available in several sizes to meet particular needs. All connections are soldered (no zinc used). Straps are attached to disc by interlocking tongue and solder. Solder is also used between copper laps. Only the purest and scale free copper is used. Bolts, nuts and lock washer are Everdur.

Westinghouse Circuit Breakers

A new line of type AB general utility circuit breakers for enclosure, panelboard or switchboard mounting is announced by the Westinghouse Electric & Manufacturing Co. These breakers, rated 50, 70, 90 and 100 amperes at 250 and 600 volts a-c 2 and 3 pole, and 125, 250 volts d-c,





Whereby a City Lives

Wires and cables beneath the streets, within the walls, a maze of cables everywhere. Through them surges the vital force whereby the city lives—giant power, all-pervading illumination, the flash of traffic lights, the rush of winging messages, or sudden fire alarm. For each service a product engineered to a particular job and manufactured with the responsibility of General Cable behind it.

GENERAL CABLE

GENERAL CABLE

BARE and INSULATED WIRES and CABLES for EVERY ELECTRICAL PURPOSE

General Cable Corporation Sales Offices: ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT
KANSAS CITY (MO.) • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROME (N.Y.) • ST. LOUIS • SAN FRANCISCO • SEATTLE • WASHINGTON (D.C.)

are especially adaptable to lighting and feeder circuits, and motor branch circuit protection.

All breakers use the 100 ampere frame, permitting physical interchangeability. Considerable improvement over the older style units have been made. Most important is the adjustable magnetic trip. This feature permits very close setting of the breaker for any tripping current from 3½ to 11 times the breaker's normal rated current, and enables the trip to be set in the field under actual service conditions to give maximum protection to the equipment. An inverse time thermal trip of the bi-metallic type provides adequate protection for light overloads, such as motor starting currents.

Annual Meeting of Inspectors in Houston

(*Continued from page* 19)

ing permits, the oil capital of the world, the world's leading spot cotton market, and second busiest port in the nation in deep sea tonnage.

Oil, cotton, cattle, high-pressure agriculture and shipping have turned the area, 600 miles long and 100 miles deep, into an economic wonderland. From Beaumont to Brownsville, business swirls above a fabulous pool of oil, the lode which called forth this development of modern El Dorado.

From this coastal strip 1,500,000,000 barrels of oil have been drawn, and still it holds 20 per cent —3,300,000,000 barrels—of the total United States reserves. The Gulf Coast is the world's largest oil refinery center. Approximately 1,000,000 barrels of the black gold are processed daily within its confines.

The area produces almost the entire world's supply of sulphur.

The most recent government figures—those for 1938—show that of the nation's four top-ranking ports in point of tonnage, three are on the Texas coast, no more than 100 miles apart.

It is evident that oil, with its concomitant, shipping, is the prime motivator in this upsurge, but agriculture, cattle and cotton still are tremendously important. A drive through this flat, humid region will prove that the oil-slattered field boot has not replaced the ornate cowboy footgear. They simply are mixed now. The Gulf Coast still produces 40% of Texas' cattle.

The production value of Gulf Coast farms is estimated at $300,000,000 annually, and the relatively new citrus business in the Rio Grande valley estimates its annual production at $50,000,000.

Southern Section's Honor Roll

Members of the Southern Section who have obtained new members during the past month are as follows:

C. S. Boger, Charlotte, N. C.	1
Carl W. Evans, Atlanta, Ga.	1
R. S. William, Atlanta, Ga.	1
Dewey Johnson, Atlanta, Ga.	1
S. Sharbrough, Dallas, Tex.	2
Joseph Whitner, Atlanta, Ga.	1
Chas. Zimmer, Houston, Tex.	1
New Members, not endorsed	3
Total	11

New members enrolled since the membership drive began last September, 1939, now total 161.

Distribution System Economics—Part I

(*Continued from page* 32)

use a kwh meter with a maximum demand attachment. The kwh and maximum demand for any particular period are noted, and the load factor is calculated from these readings by simply dividing the average kwh per hour by the maximum demand in kw. The actual number of kwh of copper loss per year are equal to **(% equivalent hrs.) × (kwh loss at peak load) × (8760).**

Salvage Value

A distribution system must of necessity be built for the future, that is, in anticipation of load growth. Loads do not always develop where expected, however, with a frequent resultant loss of investment in distribution facilities. The amount of loss will depend to a large extent on the salvage value of the system, and so it is obviously important from this standpoint to favor investments in facilities which are best adapted to meet changing load conditions. In order to be most economically adaptable to changing loads, distribution facilities should be as mobile as possible or, in other words, have a high salvage value.

Distribution facilities can be readily classified as having a high or low salvage value. Distribution transformers, feeder regulators, and unit substations are examples of the former, while overhead lines, duct systems, and brick substations are examples of the latter. It is believed that a careful analysis of past experience regarding load prognostications will often show the advantage of making a larger initial investment if it is possible to materially increase the proportion of the investment in facilities having high salvage values.

Connecting Diagrams For Lap-Wound Motors

(*Continued from page* 26)

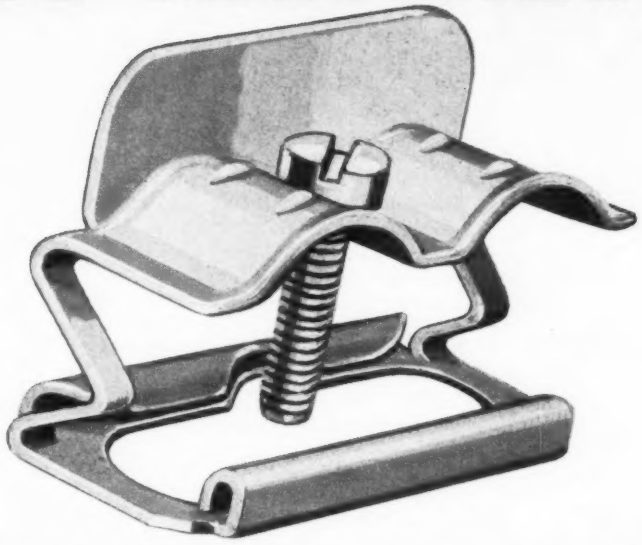
nate coils by the vacuum-and-pressure process. The first method uses an asphaltic gum and the coils are impregnated before the ground and binder insulation is applied. If there is no subsequent treatment, the coils are green coils. In the index for such coils, O as the third letter indicates class O materials, and the letter U denotes untreated asbestos tape as the binder or outside finish. Such indexes in Table I are marked with a single asterisk. Thus the index symbol AAOV* means that the coil was gum-impregnated before the ground and binder were applied and that there was no subsequent treatment. However, if this green coil should be dipped and baked, the O would change to A and the index become AAAV.

The second method involves a solventless varnish to insulate the completed coil; that is, the ground and binder insulation is applied before the impregnating process. This process fills all of the untreated materials, and changes class O to class A material and class U to class B. Thus the index AAAV can mean, as explained in the preceding paragraph, that the coil was gum-impregnated before the application of ground and binder, and afterwards was dipped and baked. But this index may also mean that the ground and binder insulation was applied before an impregnating process of the whole coil with solventless varnish.

Partially Closed Slots

Many stators and rotors have partially closed slots; and since the wires must be fed through the slot openings a few at a time, the coils are supplied without ground or binder insulation. With this type of coil the ground insulation is applied in the slots of the machine and the binder insulation applied as each coil is wound into place. This ground and binder insulation is not supplied with the coils. Coils of this type are indexed as ONN, ANN, and BNN, according to the type of conductor insulation. For Class A conductor insulation, only materials indicated in Table III, column 2, are used.

WIRING MARCHES ON!



"NM" CLAMP

RACO·ALL-STEEL KEEPS IN STEP BY DEVELOPING CLAMPS FOR EACH WIRING REQUIREMENT

MCL Switch Box with LX Clamp

Wiring has made rapid strides in the past decade. A wide-awake attitude has been necessary to keep Switch Boxes, Outlet Boxes, and Conduit Fittings ahead of the trends. During this period Raco • All-Steel has kept pace and offers an outstanding line, tailored to fit the 1940 trends. Their pioneering in the refinements of clamping devices and boxes is typical.

The MCL, a conventional square-cornered box (pictured) equipped with type LX clamps, has been a standby for years. It is designed for use with Non-Metallic Cable or flexible Non-Metallic Tubing.

BLN Box with BN Clamp

To the left is shown the BLN box, a recent refinement of the old familiar beveled corner box for Flexible Metallic Tubing (Loom). Raco • All-Steel's development of the type BN clamp, together with a well-rounded embossed "seat" provided in the bottom of the old "Loom" box, assures an ideal installation for Non-Metallic Cable. There is no chance of injury to the cable braid.

The DO-10 box, a ceiling pan, ¾″ deep—equipped with type UN clamps. This job was not adequately performed by the ordinary clamp. Raco • All-Steel supplied the answer. The UN clamp assures full protection to even the smallest diameter Non-Metallic Cables.

DO-10 Box with UN Clamp

DO-21N-3 Box with new NM Clamp

At the left, is a 3½″ octagon, 1½″ deep, cable box, equipped with the latest Non-Metallic Cable clamp—the NM clamp. Its outstanding features bid well to make it the most popular of Non-Metallic clamps. Cables may enter the box from the side or the bottom of the box or from side and bottom simultaneously. *And you don't have to change position of the clamp.* You cannot injure the cable braid—no matter what position it is in.

Why not be sure you're in step with the latest wiring trends? You'll know you are—if you standardize on Raco • All-Steel products. They provide many advantages for rural and urban modernization work, as well as on new jobs. A copy of the Raco • All-Steel products catalog is yours without any obligation. Write us today.

Distributed nationally by

ALL-STEEL-EQUIP COMPANY
INCORPORATED

209 Griffith Ave., Aurora, Ill. • *Factories:* South Bend, Ind., Aurora, Ill.

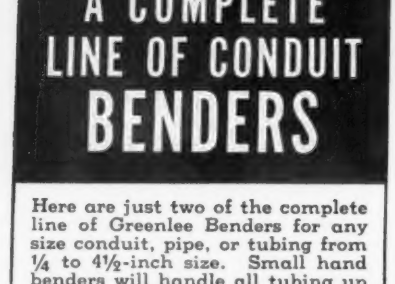
RACO • ALL-STEEL • PRODUCTS

Switch Boxes • Outlet Boxes • Cutout Boxes • Cabinets • Conduit Fittings

Distributors in All Important Centers

A COMPLETE LINE OF CONDUIT BENDERS

Here are just two of the complete line of Greenlee Benders for any size conduit, pipe, or tubing from ¼ to 4½-inch size. Small hand benders will handle all tubing up to ¾-inch, while for rigid and thin-wall conduit, pipe, bus-bars, and the larger sizes of tubing, powerful hydraulic units are available. Write for detailed information about this complete line of benders and attachments.



The Greenlee No. 770 Bender shown above, designed for bending conduit and pipe from 1¼ to 3-inch size, has a maximum hydraulic piston pressure of 25 tons. A similar bender, the No. 775, has a more powerful hydraulic unit with a maximum piston pressure of 40 tons for bending 3 to 4½-inch conduit.

This Greenlee No. 770-T Hydraulic Bender for bending thin-wall Electric Metallic Tubing, consists of the No. 770 Power Unit equipped with special attachments designed to make a full 90° bend quickly with one forward movement of the ram. These attachments are easily and quickly applied to the No. 770 Power Unit.

GREENLEE TOOL CO.
1707 Columbia Ave., ROCKFORD, ILL.

On large alternating-current motors or stators the coils consist of straps, and these may be had in any of the indexes of Table I except slot size.

Open-Slot Coils

The letter N indicates the absence of ground or binder insulation. However, for many open-slot coils for alternating-current stators and rotors or direct-current armatures a binder is used, but no ground insulation is applied to the slot section of the coils. In other words, extra material must be applied to the slots of the core as the coils are wound in. In Table I the indexes for this type of coil are ANA, ANO, BNB, BNA, ONA, and ONO. For each of these indexes no slot-size coil is shown available in the table. Therefore on repair work when negotiating renewal coils for open-slot coils it is necessary to compare all the letters and to watch particularly for the letter N for ground insulation. If N is used where O, A or B should be used it means the purchase of additional slot materials and the expenditure of extra time in winding the motor.

For alternating-current stators and rotors, on direct-current armatures using open-slot-formed and insulated coils, the letter used to denote the type of ground insulation plays an important function. A reference to Table IV shows the better materials that are included in the change from each column. One bidder for repair work may use class A material and another a class B material; thus the ground insulation letter might show the reason for price differences. The index AAA as compared to ABA means treated cloth as compared to mica ground insulation.

The next article of this series will start a new series of three phase star and delta connections only, for the ten and twelve pole lap wound motors.

Applying the National Electrical Code

(*Continued from page* 23)

133 amperes. A No. 2/0 AWG wire having a current carrying capacity of 150 amperes is the smallest wire that may be used. It should be noted that beyond the set of fuses at the end of the tap the conductors may supply any number of circuit breakers or fuses.

When locating over-current devices three points must be kept in mind:

(1) They must be readily accessible except as previously discussed for services, i.e., when located at outer end of service raceway, or except as provided for in the case of busways to be discussed later.

(2) They must be protected from mechanical injury, and

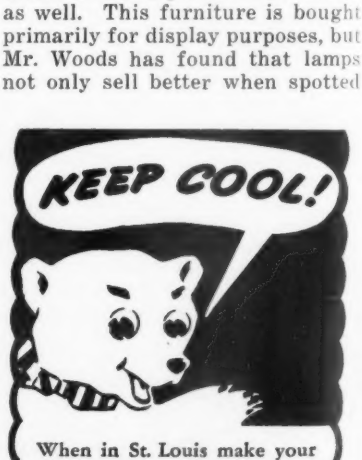
(3) They must not be located in the vicinity of easily ignitable material.

Lower Overhead and Higher Sales

(*Continued from page* 21)

much more often. It is convenient for them to meet their clients here and inspect fixtures without confusion or trouble. We lowered our overhead by the move and, at the same time, increased our sales and improved our service."

The Woods Electric Company remodeled an attractive brick residence, retaining the home-like architecture for the exterior, but adding electric signs. This new sales room and office contains 5,000 square feet of space. A full stock of fixtures, tables, lamps are carried. This firm not only does a good business in lighting fixtures and lamps, but sells many tables and odd pieces of furniture as well. This furniture is bought primarily for display purposes, but Mr. Woods has found that lamps not only sell better when spotted



When in St. Louis make your visit a comfort success! Stay at Hotel Lennox.

Relax in a guest-controlled air-conditioned room . . . enjoy fine food and drink in cool restaurants. Bath, radio, icewater in every room. Convenient parking at this downtown AAA hotel.

Rates . . . 50% of all rooms, $3.50, or less, single; $5.00 or less, double. Special rates for families.

COMPLETELY AIR-CONDITIONED
HOTEL Lennox
9th & Washington • St. Louis, Mo.
Nearby Parking and Garages

on a proper type table, but that many women like the combination and want the table as well as the lamp.

Although fixtures at most all price ranges are carried, and the same is true of lamps, more stress is placed on the better quality merchandise. "We don't go after the real cheap business, for we don't carry any of that merchandise, but we do carry a stock within the range of reasonable demand," Mr. Wood explained. "We concentrate on the contractors and architects that build the better type buildings. And we contact prospective home owners, too, to show them the value of investing a reasonable amount in lighting fixtures."

Three-Year School Lighting Experiment

(*Continued from page* 15)

proved as signs of study and proved as signs of eyestrain, in the rooms with adequate lighting. Equally noticeable was cheerfulness and alertness, slackening of mental and physical fatigue rates, lessening of sleepiness.

Rooms in which tests were made were all located on the north side of the school building and had approximately equal natural light from the same number of windows per room. More care in adjusting window shades in the controlled-lighting rooms compensated in part for the added current load. Rooms with traditional lighting had 150-watt lamps in prismatic glass reflectors. Automatically-controlled rooms were fitted with indirect luminaries, three nearest the windows with 300-watt lamps, three nearest the wall with 500-watt lamps, six in all.

These tests were under direction of educators, lighting engineers, the optometrist, teachers and school nurses. The personnel was directed by Dr. W. J. Saupe, professor of education at University of Missouri, and included E. A. Elliott, superintendent of schools in Joplin. Lighting engineers were Mathew Luckiesh, lighting research director of General Electric at Nela Park, Dr. F. K. Moss and Alston Rogers, both of the Nela Park laboratory, and Charles F. Wells, Empire District Electric Company, in Joplin.

Concensus of opinions of educators is that the adequate-lighting test would prove to have continuing benefits if continued throughout the school-life of any group of students. However, results attained

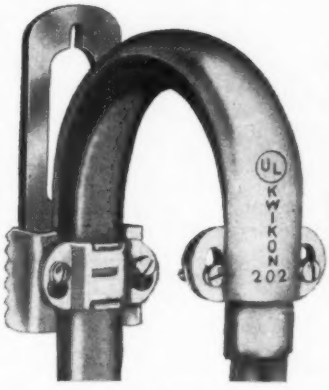
Here's How

to install

Service Entrance Cable

Faster—More Economically

use



KWIKON No. 202
Service Cable Head

only 20c each

in lots of 50 or more

Economy and an easier and faster installation have made Kwikon No. 202 a national favorite. Improved by the new hanger type back, which makes the assembly and installation so much easier, it comes to you at no additional cost.

To be completely satisfied on your next Service Cable Head requirements, use Kwikon No. 202.

Approved by Underwriters' Laboratories, Inc.

KWIKON CO. 626 W. JACKSON CHICAGO, ILLINOIS

GIVEN with every CORY Brewer. Fits most other glass coffee makers. A big seller at 50c.

All America Wants CORY-Brewed Coffee and Tea

Sales of CORY Coffee Brewers keep hitting new peaks, month by month, because the public has discovered that CORY-brewed coffee is *dependably* smooth and delightful . . . with the *true coffee flavor*. No bitter metallic taste, because no contact with metal, even in the filter.

CORY-brewed coffee and tea are flavor-protected, too, against boiling or too long brewing. Models for every home and restaurant use are shown in *complete catalog*. Glad to send it to you FREE.

THE CORY REG. U.S. PAT. OFF. COFFEE BREWER

Always Sold Complete!

Always included in the CORY price are complete de luxe fittings required for operation, convenience and smartness. They include: Hinged Decanter Cover; "Safety Stand" Funnel Holder; 2-tablespoon Coffee Measure; CORY Glass Filter ROD. Most models also have the famous "Fast Flo" Filter. Electric units are all 2-heat. The special heat-resisting glass is by CORNING—and every piece of glass is beautifully decorated with platinum striping.

Complete Catalog shows all the models, special deal-assortments, outstanding "dealer helps", etc. *Gladly mailed* FREE. Write for YOUR copy today.

GLASS COFFEE BREWER CORP.
325 No. Wells St., Chicago, Ill.

in this test-schedule completely prove that the cost of adequate lighting is more than offset by gains in learning speed for the average student, and again in savings in cost of glasses—a gain which is more individualized. (No optometrist would venture to assess the latter savings on the basis of such short-time experience, other than to say it actually exists, especially because the school experiment was either helped or hindered by lighting standards maintained in homes of pupils subject to the test).

Protective Lighting For Industrial Plants

(*Continued from page* 17)

and directed nearly parallel with the fence.

Particular attention has been given the spur track and its alley between the buildings, floodlighting projectors are recommended to throw light the length of the spur and brilliantly illuminate its gate through the fence. Additional medium-spread and concentrating-beam floodlights are indicated on the building corners near the spur entrance—one of the most vulnerable points in the entire plant layout—for maximum protection.

The factory street on the right hand side of the office building is lighted with concentrating-beam floodlights which are directed the length of the street from each end. Additional lighting is provided here by porcelain enamel floodlights on the roof of the adjacent building.

General yard lighting, for protection as well as to facilitate night operations, is provided by medium-spread and concentrating floodlights—depending on the size of the area and their distance from it. Floodlights are located advantageously on building corners and directed as required.

N.E.C.A. Convention Plans Complete

(*Continued from page* 20)

outside exposure.

On their arrival in Havana at 9 o'clock Saturday morning the party will be put up at the Hotel Plaza. Saturday and Sunday will be spent in sightseeing in the old and new Havana and into the picturesque countryside surrounding the city, with views of fields of sugar cane, Royal Palm trees, cocoanut groves and glimpses of the native life in this foreign country. And on Saturday night there will be adventure amid the scenes of Havana's famous night life.

Returning to Miami on Monday morning there will be two days of delightful touring through Central Florida, with stop at the Bok Tower at Lake Wales, an overnight visit in Tampa and a trip to the famous Silver Springs at Ocala, before arriving back in Jacksonville on Tuesday evening in ample time to board the trains for home.

The total cost of the Post-Convention Tour for the six days from Jacksonville back to Jacksonville, will be covered by the all-expense rate of $85.00 per person. Every detail in the handling of baggage, meals at all points, tips of all kinds both through Florida, on the steamer and in Havana, will be taken care of by the tour conductor.

Tentative reservations for the Post-Convention Tour should be sent in to NECA Headquarters as soon as possible, so that block bookings can be made for the necessary hotel and steamship accommodations.

Football Conference Contest for Fall

(*Continued from page* 13)

plus T.C.U.'s 12.

There are two ways of harnessing this clever combination of each man's own sales points and the actual points made by the team he represents. One is to have a series of small weekly prizes; items costing around $1, such as a carton of cigarettes, a pair of theatre tickets, and such items. Half as many prizes should be offered each week as there are salesmen: then the salesmen are paired for the week in individual competition according to the pairings of the football teams in the actual conference, the winner getting the weekly prizes. For instance, if, in the second week of the contest, T. C. U. plays S. M. U., with Jones representing T. C. U. and Smith representing S. M. U., Jones' score (combining his own with T. C. U.'s) is matched against Smith's total of his own points and those scored by S. M. U. for the small weekly prize.

Here it is apparent why so liberal a point evaluation is given the mens' quota percentages: in the first place, large scores tend to make more amusement and merri-

You will be too when you see it! Beautiful in appearance, easy to operate, new typing aids save time and energy. Automatic margin set. New concealed touch selector. New line space mechanism. New card holder. Plus the time proven *floating shift*, interchangeable platens and other features. Free demonstration at

The new Super-speed

L. C. SMITH & CORONA TYPEWRITERS, INC.
701 E. Washington St., Syracuse, N. Y.

To PREPARE — First REPAIR

Today, more than ever before, we hear of national preparedness. This can only be obtained as a result of industrial preparedness.

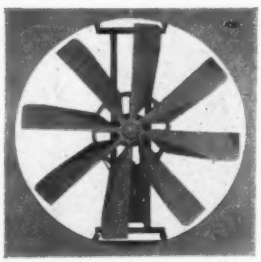
Right now, industrial production schedules cannot tolerate any interruption. Elecrical equipment must not fail. Motor windings must be in first class condition to withstand the continued operation that will be imposed on all motorized equipment.

Why not have your maintenance department start a regular schedule for treating your motor windings with DOLPH'S CHINALAK Black Baking Varnish? You will save money as a result of less "time out" for repairs. You will enjoy smooth running production without costly, annoying delays. Wrie for the full story of CHINALAK today.

JOHN C. DOLPH CO.
Insulating Varnish Specialists
166 Emmett Street, Newark, N. J.

BUILT-IN SPRINGS

. . . . cradle the entire motor and blade assembly and eliminate vibration noises in the Coolair Home-Cooling Fan. This is one of several exclusive features that help sell Coolair fans and keep them sold. Write for FREE catalog today.



Coolair Ventilating and Cooling Systems
AMERICAN COOLAIR CORPORATION
Manufacturers . . . . JACKSONVILLE, FLORIDA

THEY'RE NEW!

NEW FEATURES...NEW PRICES...NEW MODELS
And NEW
OPPORTUNITIES FOR YOUR PROFIT
With
A COMPLETE LINE OF
"AUTOMATIC"
TIME SWITCHES
Write for Information
AUTOMATIC ELECTRIC MFG. CO.
Mankato, Minnesota

NEW BUSINESS OPPORTUNITY

DEALERS are discovering that this modern kitchen market can be their most profitable market if they know how to reach it quickly and effectively. Here are 10 reasons why Youngstown Pressed Steel Kitchen units can be your big business opportunity.

- PRE-SOLD MARKET
- UNSATURATED MARKET
- HIGHEST QUALITY MERCHANDISE
- LOW PRICES
- FLEXIBLE LINE
- EXCELLENT PROFIT
- PROVEN SALES PLAN
- NO TRADE-IN
- NO SERVICE
- NO REPOSSESSIONS UNDER FHA PLAN

YOUNGSTOWN KITCHEN EQUIPMENT
TRADE MARK YPS REG. U. S. PAT. OFF.
YOUNGSTOWN PRESSED STEEL DIV.
MULLINS MFG. CORP.
WARREN, OHIO

YOUNGSTOWN PRESSED STEEL DIVISION
Mullins Manufacturing Corporation, Warren, Ohio
PLEASE SEND ME COMPLETE INFORMATION ON THE *"Youngstown"* DEALER FRANCHISE FOR MY TERRITORY.
Name_____
Address_____
City_____ State_____
DEPT. ES-940

ment, and in the second, it is designed to let the men's own points be the larger contributing factor to their weekly scores, with the scores contributed by the football teams being less of a deciding factor than their own sales efforts.

Another way to harness this combination of scores is to record which salesman wins the most games. It is even more desirable to do it both ways, if the budget will stand it, and the weekly prizes need not cost more than $5 or $6 for the average sales staff.

In addition to the prizes based on the scores including the football teams' scores, it is necessary, of course, to award a set of prizes based on the men's straight conference standing, that is, their own points made by achieving their quota, without the injection of the outside chance element; there should always be awards for merit, unaffected by outside elements which are injected to add zest to the contest.

The coupling of the men with the teams they represent in the weekly conference football games will be a real bell-ringer in creating interest, enthusiasm and good spirit. If some of the men represent teams not in the conference, or teams not matched in conference games, their scores can be matched anyway. In the promotion of this contest, the manager should post a schedule of each week's games on the bulletin board by the scoreboard each week, with notations as to which salesman is "playing" which team this week. Another good idea is to connect a radio in the store on Saturday afternoon and pick up play-by-play reports on the various games and the final scores of all games available; this will keep the interest high.

Considerable attention should be given the scoreboard also: it is a good idea to lay it out on an extra large board, leaving a wide margin. Then secure photographs of the teams, or members thereof, that are represented in the contest, and mount them on the border. These can be clipped from newspapers, or often original photos can be secured by writing to the publicity departments of the various schools involved. An additional trick is to mount snapshots of the salesmen themselves alongside the pictures of the teams they represent.

The house organ, too, can be played up strongly in this contest, with all the catchy terms of football parlance at the manager's disposal. Men not making their quota have been "breaking training," or are "off on their blocking," and so on.

This contest is an excellent one to begin any time from September on, and will do a splendid job of creating interest and competitive spirit among the salesmen.

Advertise Your Store's Personality

(*Continued from page* 9)

You can use any of them, or all of them, depending upon how big your business is. If your business is small, don't try to use all of these means of advertising—your advertising money will be spread out so thin it won't do much good.

This personality advertising (if you were "big business," you'd call it "institutional" advertising) can't be expected to bring scathes of customers into your store after the appearance of the first advertisement or two. But continued over a period of years, and provided that your policies back up what you say in your advertising, it will go far toward insuring that new and old customers will continue to come into your store.

And you won't have to be so worried when Super-Super threatens to move its line to the fellow in the next block. But oddly enough, you'll probably find that Super-Super and other manufacturers like to hang on to their dealers who do "personality" advertising.

But—don't make statements in your advertising, whatever its form, that you can't or won't back up. It won't take your prospects and customers long to learn that you don't keep your word. And how your competitors would capitalize on that!

National Washer and Ironer Week

(*Continued from page* 12)

would have been so far reaching in its effects, both on our sales and our salesmen, I would have been shouting for such a promotion long before. This drive seemed to give our men the extra 'umph' that was needed to close prospects hanging fire and seemed to stimulate them to go after new ones with renewed punch. Let's have another one bigger and better every year."

NEW NOW only $1.50
Fish Tape, Reel & Puller
No. 00 "HANDY"

Complete fishing equipment at the usual price of a Reel only! Gives you safe, sure grip while fishing—no costly tape breakage—no dangerous live wire contacts from loose tape. Only 7" in diameter—easily fits in kit. Complete with 50 ft. of top quality 1/8" x .045" tape. Ask about 7 other sizes of reels to meet every requirement.

NEW BX ARMOR CUTTER

Strips BX armor in one simple operation! No more nicked insulation—shorts—or wasted BX. Jaws take BX cable of any make, 2 or 3 wire, No. 12, No. 14. Handy pocket size. Inexpensive. See one at your jobber's.

IDEAL SOLD THROUGH JOBBERS
Electrical Products Division
IDEAL COMMUTATOR DRESSER COMPANY
1017 Park Avenue Sycamore, Illinois

MEET ME IN ST. LOUIS

I'm Jimmie, the bike-riding chimp, at our big Zoo. Famous Muny Opera, major league baseball are other St. Louis attractions.

And be sure to stop at Hotel Mayfair. Relax in a guest-controlled air-conditioned room... enjoy fine food and drink. Bath, radio, ice water in every room. Convenient parking at this downtown AAA hotel.

Rates... 50% of all rooms, $3.50, or less, single; $5.00 or less, double. Special rates for families.

COMPLETELY AIR-CONDITIONED
HOTEL Mayfair
Eighth & St. Charles • St. Louis, Mo.
Nearby Parking and Garages

BIG BELLS for LITTLE PRICES

UNIVERSAL VIBRATING BELL

This non-adjustable, universal, vibrating type bell is of double coil construction. Recommended for such uses as burglar and fire alarms, call signals and elevators. Base and cover are drawn steel and gong is nickeled. Operates on either 1½ to 3 volt battery or bell ringing transformer. Standard finish is black enamel. 5″—$1.60 list; 6″—$1.80 list; 8″—$2.80 list. See your jobber for your cost.

SIGNAL ELECTRIC MFG. CO.
MENOMINEE, MICHIGAN

SIGNAL

Branch Offices:
W. E. Hopper
357-59 Marietta St., Atlanta, Ga.
Geo. E. Anderson
Santa Fe Bldg., Dallas, Texas

CARTER HOTEL

CARTER COMFORT CLEVELAND

..3 C's

YOU CAN PROFITABLY REMEMBER

It's an easy rule to remember when you come to Cleveland. Head right for friendly Hotel Carter and you're sure to enjoy your stay in this friendly city.

600 outside rooms. All with bath and circulating ice water.
3 air-conditioned restaurants.
EXCELLENT CONVENTION FACILITIES
Single from $2.75 • Double from $4.00

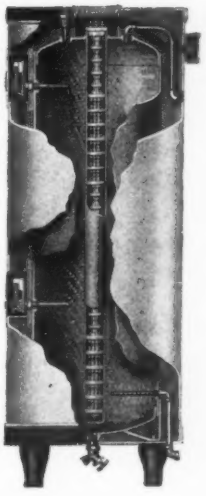
HOTEL CARTER

Prospect near Ninth, Cleveland
J. BINGHAM MORRIS, Managing Director
Affiliated with American Hotels Corporation of N. Y.
J. LESLIE KINCAID, President

1915 —— 1940

Twenty-five years of Specialization in Electric Water Heaters

SEPCO



Only SEPCO has:

Hi-Speed, No-Burn-Out Unit

Hard, scale-forming water and accidental 'dry' operation has no effect on this heating unit. Fastest heating due to internal circulation.

Genuine Cork Insulation

Retains original high efficiency permanently—uneffected by Moisture will not settle; vermin proof.

Vapor Tension Thermostats;

Principal used in all High Grade Temperature Instruments insures instant and accurate control.

Write today for complete details of our Silver Anniversary Models.

14 Distributors
Serving the South

AUTOMATIC ELECTRIC HEATER COMPANY
Pottstown, Penna.
Southern Division Headquarters
P. O. Box 1707 Birmingham, Ala.

ADVERTISER'S INDEX

The Advertisers' Index is published as a convenience, and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

A

Adam Electric Co., Frank 3
All-Steel Equip. Co. 49
Aluminum Co. of America ..... *
American Coolair Corp. 53
American Steel & Wire Co. 2
Anaconda Wire & Cable Co. 4
Asplundh Tree Expert Co. ..... *
Automatic Electric Heater Co., Inc. 55
Automatic Electric Mfg. Co. 53

C

Columbia Steel Co. 2
Crescent Insulated Wire & Cable Co., Inc. 40

D

Dolph Co., John C. 53

E

Edison General Electric Appliance Co. ..... 27, 28 and 29

F

Frederick Iron and Steel Co. ..... *

G

General Cable Corp. 47
General Electric Co., (Lamps) 6
General Electric Co., (Varnished Cloth & Tapes) ..... *
General Electric Co., (Wiring Materials) ..... Back Cover
Glass Coffee Brewer Corp. 51
Graybar Electric Co. ..... *
Greenlee Tool Company 50

H

Hazard Insulated Wire Works 1
Hotel Carter 55
Hotel Lennox 50
Hotel Mayfair 54
Hubbard & Co. ..... *
Hunter Fan & Ventilating Co., Inc. ..... Front Cover

I

Ideal Commutator Dresser Co. 54

K

Knox Porcelain Corp. ..... *
Kwikon Co. 51

L

Landers, Frary & Clark 45

M

Mullins Mfg. Co. 53

N

Noblitt-Sparks Industries, Inc. 37

O

Okonite Co. 1

S

Sangamo Electric Co. ..... *
Signal Electric Mfg. Co. 55
Smith, L. C. & Corona Typewriters, Inc. 52
Square D Company ..... Inside Back Cover

U

United States Steel Co. 2

W

Walker Bros. ..... *
Walker Electrical Co. ..... *
Ward Leonard Electric Co. ..... *
Westinghouse Elec. & Mfg. Co. (Full Line) 35
Westinghouse Elec. & Mfg. Co., (Refrigerators) ..... *
Westinghouse Elec. & Mfg. Co., (Water Heaters) ..... *
Wiegand Co., Edwin L. 39
Wiremold Company ..... *

Y

Youngstown Pressed Steel Division 53
Youngstown Sheet & Tube Co. ..... Inside Front Cover